AMERICA'S LARGEST TEXTILE MONTHLY

COTTON

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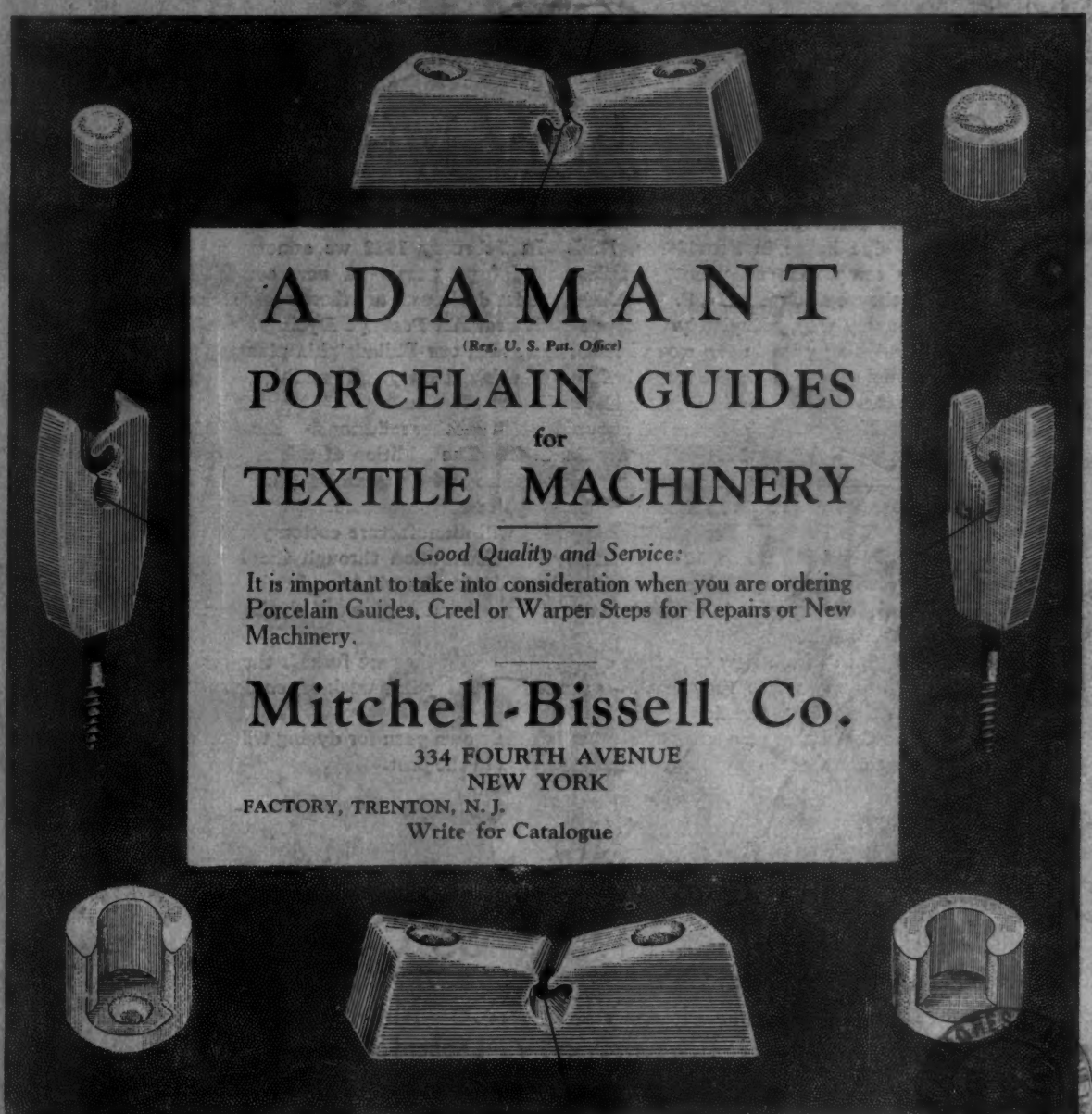
ADAMANT
(Reg. U. S. Pat. Office)
PORCELAIN GUIDES
for
TEXTILE MACHINERY
Good Quality and Service:
It is important to take into consideration when you are ordering Porcelain Guides, Creel or Warper Steps for Repairs or New Machinery.
Mitchell-Bissell Co.
334 FOURTH AVENUE
NEW YORK
FACTORY, TRENTON, N. J.
Write for Catalogue

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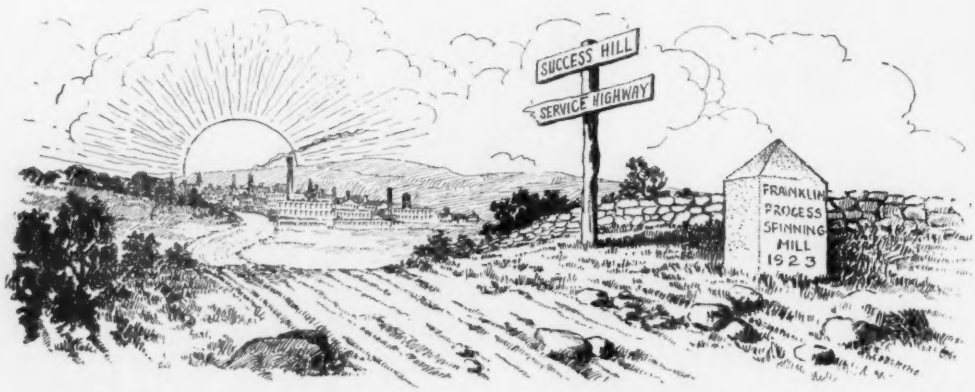
LIBRARY



Still another Milestone

IN FEBRUARY 1921 we announced the completion of a new commission dye house in Providence, R. I. In February 1922 we announced the completion of "another milestone" of progress,— a new commission dyehouse at Greenville, S. C. Both of these dyehouses are thoroughly modern in every way, completely equipped with Franklin Package Dyeing Machines for dyeing yarn in the wound form, and, with our Philadelphia plant, also a model dyehouse, make a total of three in this country. In addition to these we also have a plant in Denton, England, near Manchester.

Now we take pleasure in announcing still another milestone,— the Franklin Process Spinning Mill at Fingerville, S. C. The addition of this mill to our organization increases the range of our service and by eliminating unnecessary processes will result in material advantages to our customers.

The Franklin Process Spinning Mill will manufacture cotton yarns, both single and ply up to 30's exclusively for distribution through the Franklin Process Company. Our three commission dyehouses will hereafter carry large stocks of grey yarn in these counts to apply only on customers' dyeing orders, if they so desire.

Thus, from now on, when customers specify that we furnish the yarn in counts up to 30's they can be assured of delivery in a week or ten days or in less time if the occasion demands.

Customers who still wish to furnish their own yarn for dyeing will receive the same courteous and prompt attention as in the past.

FRANKLIN PROCESS COMPANY

Yarn Dyers · Yarn Spinners · Mfrs Glazed Yarns · Dyeing Machines

Philadelphia · PROVIDENCE · Manchester, Eng.

New York Office 72 Leonard St.

SOUTHERN FRANKLIN PROCESS COMPANY

Greenville, S. C.

Increased Production Labor's Shortest Road to Good Wages and Short Hours

Textile Workers who look to the future see abundant reason for serious thought. Although among the lowly-paid industrial workers before the War, they now enjoy a high place as well-paid laborers in the industrial world. But to keep what they have gained, the industry as a whole must find a way to meet its present troubles.

To Escape Lower Wages You Must Produce More

This is the situation Textile Workers must face everywhere. Wages and Labor's Living Conditions are best where production per unit of labor is highest. Production is highest where improved machinery gets its best chance. Without Improved Machinery, Labor would be still facing the conditions of a Century Ago.

The Northrop Loom is the Textile Workers' best tool to preserve their present jobs in the home town at good wages.

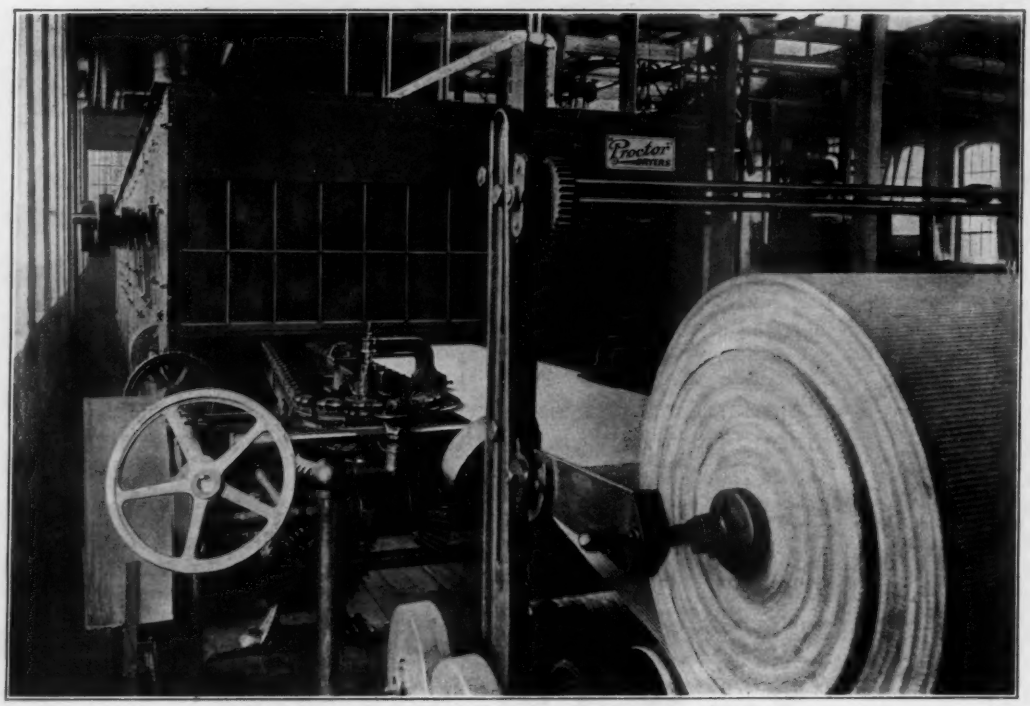
Think It Over.

DRAPER CORPORATION

HOPEDALE MASSACHUSETTS

SOUTHERN OFFICE ATLANTA GEORGIA

Copyright 1917 by Draper Corporation



An Improvement for Tentering Machines

The capacity of an open tentering machine can be increased from 25% to 100%—without increasing the size of the tenter or requiring additional operators—by "closing in" that machine with the "Proctor" Housing and Air Recirculation System.

The "Proctor" equipment is comprised of an insulated enclosure containing steam coils and fans which combine to produce a confined, efficient circulation of uniformly heated air through the cloth in the tenter. Uniformly perfect drying is obtained at a high rate of speed. Great savings in steam, labor and space effect radical savings in tentering cost. Also due to the confinement of heat, the surrounding work rooms are made comfortable for operatives.

After installing the "Proctor" equipment pictured above, the Highland Park Manufacturing Company wrote us as follows: "We are now running our tenter at the rate of 80 yards per minute and could run faster . . . . . we find it necessary at times to throttle down the steam to prevent the housing from getting too hot . . . . . this housing solves the problem of drying cloth when passing through a tentering machine and is far above anything else that has ever been used."

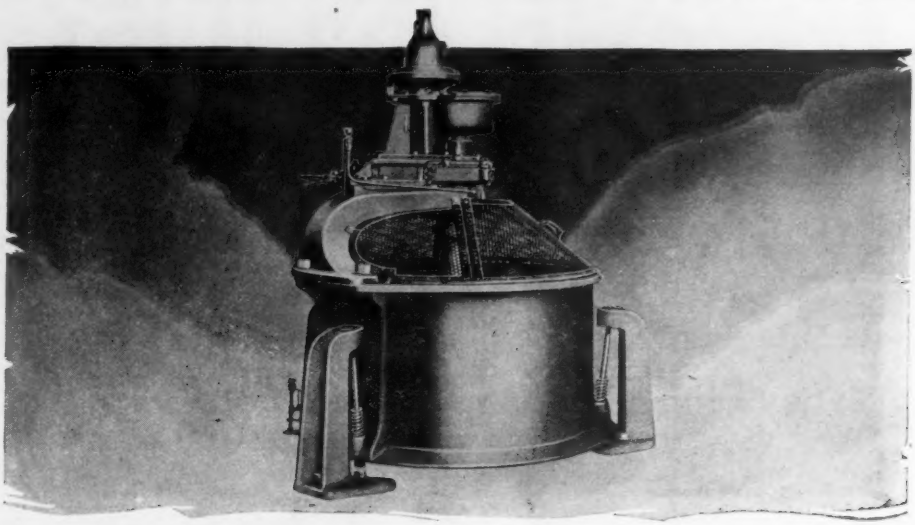
This is a typical experience. Many other cotton and woolen goods mills have made far-reaching, profitable improvements by installing "Proctor" Housings for tenters of all types and makes.

Send for our Bulletin No. 62.

PROCTOR & SCHWARTZ, INC.

PHILADELPHIA

SKF



Longer Service and Few Repairs
When Extractors are Ball-Bearing Equipped

THE high speeds at which extractors operate and the strains of possible unbalance soon cause ordinaty bearings to develop play, resulting in serious vibration which shortens the life of the machine. Then, too, if the necessary bearing replacements are not made soon enough the rotating and stationary elements of the extractor are likely to strike each other with disastrous results.

On this extractor Hess-Bright deep-groove ball bearings keep the shaft permanently in position without need of adjustment as this type of bearing develops no undue looseness during years of service. Furthermore it takes radial and thrust loads in combination thus eliminating the need of a separate thrust bearing and simplifying construction and maintenance.

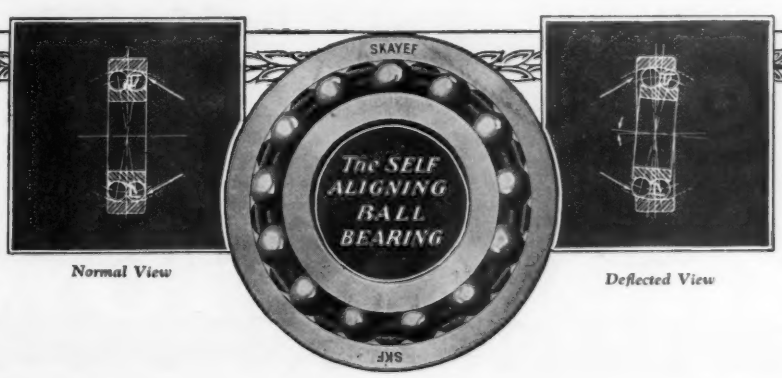
Experienced users demand world renowned **SKF** marked ball bearings on textile equipment of all kinds not only because of their precision and power saving features but for still more important reasons which our engineers will gladly outline on request.

Ask for illustrated literature giving full details. It will be sent without any obligation to you.

THE HESS-BRIGHT MANUFACTURING COMPANY

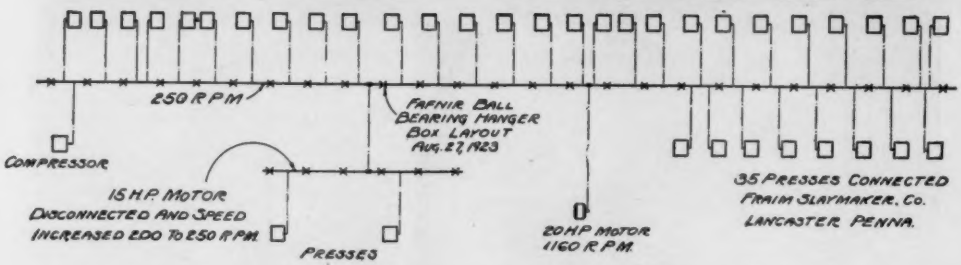
Supervised by **SKF** INDUSTRIES, INC., 165 Broadway, New York City

1106



Normal View *Deflected View*

FAFNIR


250 R P M
FAFNIR BALL BEARING HANGER BOX LAYOUT AUG. 27, 1923
COMPRESSOR
15 H.P. MOTOR DISCONNECTED AND SPEED INCREASED 600 TO 650 R.P.M.
PRESSES
20 H.P. MOTOR 1160 R.P.M.
35 PRESSES CONNECTED FRAIM SLAYMAKER. CO. LANCASTER PENNA.

They Eliminated One of Two Motors and Increased Production

You will be interested in the remarkable power saving accomplished at the plant of the Fraim Slaymaker Co., Lancaster, Penn., by replacing twenty-five ring oiling line shaft bearings with *Fafnir Double Ball Bearing Hanger Boxes*, as indicated in the above diagram. To those who have never used *Fafnir Boxes* these results may seem like a power saving chapter from the Arabian Nights, yet anyone can obtain results which are just as extraordinary.

Briefly, the change to *Fafnir Boxes* here resulted in 65 per cent load reduction with the belts on the loose pulleys, and 29 per cent saving of the maximum load. Whereas two motors of 20 and 15 horsepower, respectively, were formerly required, both lines are now driven by the 20 horsepower motor alone. The speed of one of the lines of the shaft has been increased 50 R.P.M., with corresponding increase in production. The annual saving is $340.33, or 77 per cent of the cost of the *Fafnir Boxes*, including cost of erection and an allowance for depreciation.

The power tests at the above plant were made by an electrical engineer using a graphic electrical recording machine. We will be glad to send details of this test, or of any of the many others which we have made, to anyone who is interested in efficient power transmission.

The Fafnir Bearing Co.

New Britain, Conn.

Southern Representatives

O. R. S. POOL,
220 Vail Ave., Charlotte, N. C.

A. G. LAUGHRIDGE,
P. O. Box 1847, Atlanta, Ga.

A New Word in Plant Illumination

The illustration shows a night view of the Crompton Mills, Crompton, R. I., famous makers of velvets, velveteens and corduroys. They have used Cooper Hewitt Work-Light since 1917.

WORK-Light—a new name for Cooper Hewitt light which explains instantly why it is different from any other light.

Not "artificial daylight," not "that greenish light," not "mercury vapor light;" but "*work-light.*" That name bites in. Every factory manager knows what it means.

Think of the various kinds of illumination:—soft reading lights, dim candle lights, brilliant footlights, intense spotlights, powerful searchlights, spreading street lights, and scores of others, performing their specific jobs.

Then think of the special job that Cooper Hewitts perform; a light to work by—a *work-light.*

Conditions in modern industrial plants necessarily require special lighting as well as special tools and machinery. Good workmanship demands it—good workmen deserve it!

The best production records are made in plants where Cooper Hewitt Work-Light is installed; and it is significant that this method of lighting is most extensively used in manufactories where high production schedules dictate the choice of method and equipment from order desk to shipping platform.

The response of plant engineers to this specialized *work-light* is not surprising, but the results in dollars, increased production and reduction of spoiled work are amazing—even in these days of titanic industrial progress.

We believe the time is coming when the quality of work-light in our factories will determine both production and profits.

You will want to know more about Cooper Hewitt Work-Light. Send for the booklet; you will find the details interesting.

Cooper Hewitt Electric Co., Hoboken, N. J.

89 River Street

COOPER HEWITT

Work-Light

How many of your coal dollars buy *coal?*

Ashes are cheap—when you buy them as ashes—but when bought as coal they must be paid for thrice. First, in the purchase price of coal; second, in subsequent power loss; and, third, in heavy haul-away costs. Dirt, non-combustible impurities, and high ash content soon prove cheap coal an expensive economy.

Those in the coal business know that praise is rare. Absolute satisfaction manifested by continued and increasing orders is the only proof we have of our customers' opinion of General Coal Company's products.

If you are a user of coal for power, heat, or gas, we will gladly assist you in producing more--for less.

Admiralty Coal STONEGA RODA DEPENDABLE COAL

GENERAL COAL COMPANY

1727 Land Title Building

PHILADELPHIA

BUNKER COAL
Supplied at
Baltimore, Md.
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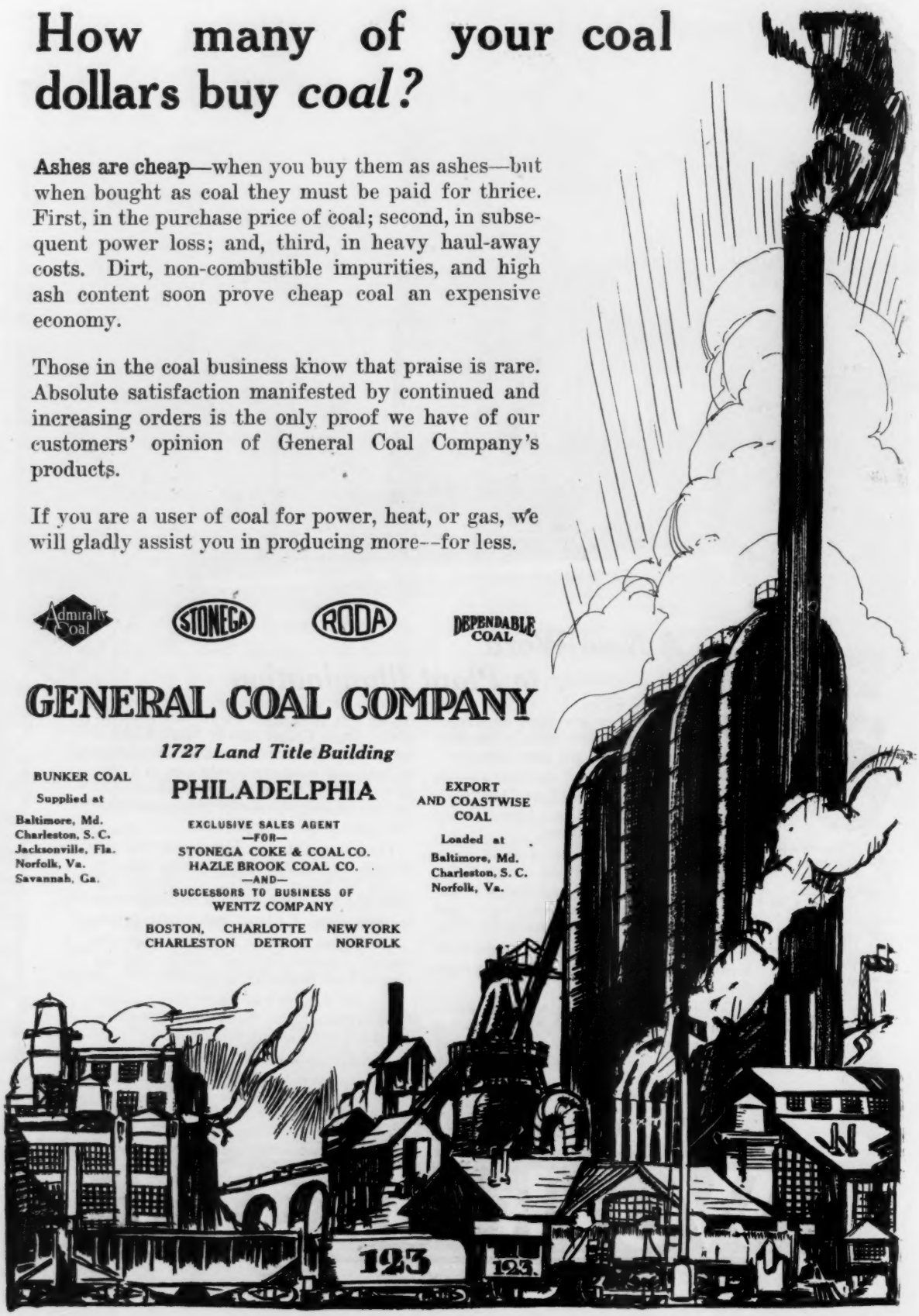
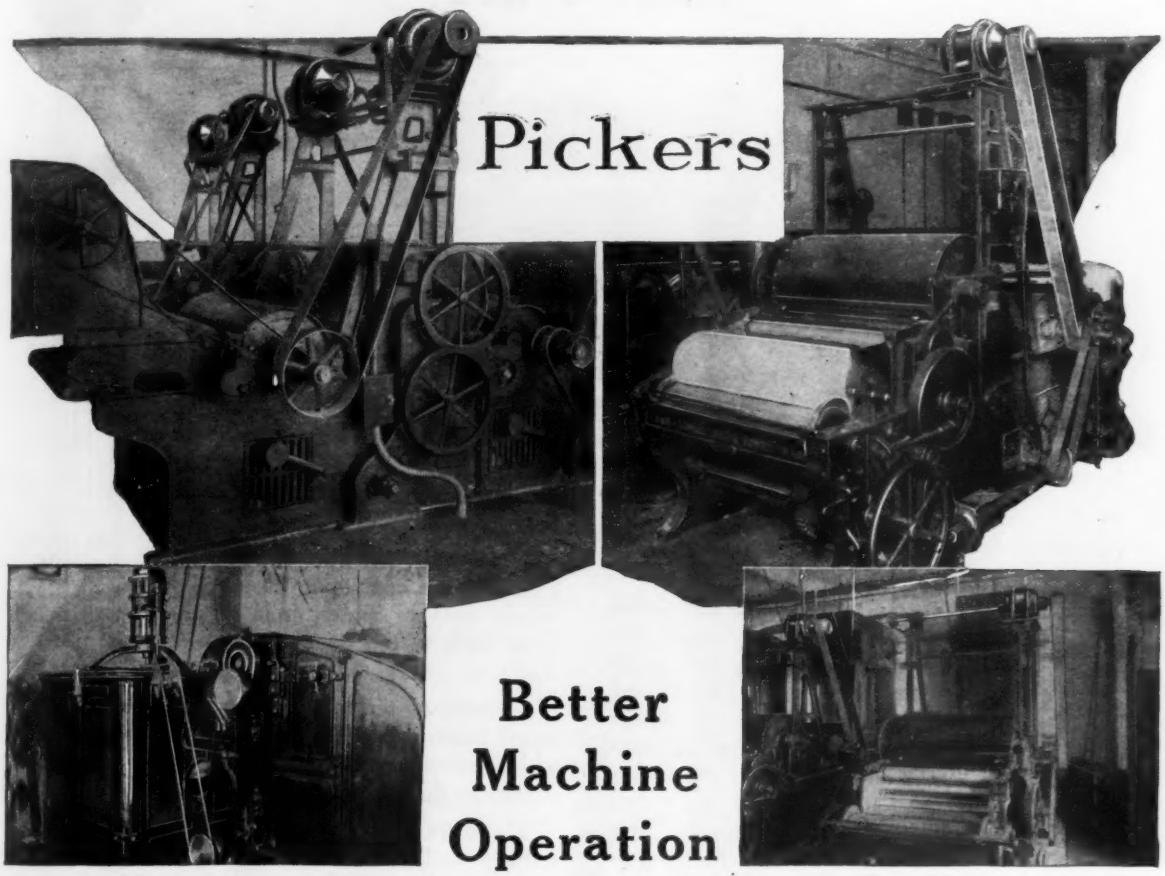
EXPORT
AND COASTWISE
COAL
Loaded at
Baltimore, Md.
Charleston, S. C.
Norfolk, Va.



Cotton

Use Individual Motor Drive



In the Picker Room individual motor drive produces economies by providing flexibility of operatior., eliminating shafting load, and reducing the number of belts to a minimum.

G-E textile motors are specially designed for this service—are furnished with screened bearing heads; waste-packed, dust-tight bearings; and conduit terminal boxes. The insulation of the windings is moisture resisting, to avoid injury to motors from operation of sprinkler system in case of fire.

These motors are also designed for different methods of drive—with single shaft extension and one pulley for single beater pickers; single shaft extension and two pulleys for 2-beater pickers; and double shaft extension with two pulleys and three bearings where the drive comes on opposite sides of the machine.

Vertical openers may be driven by direct-connected vertical motors when the machine speeds will permit.

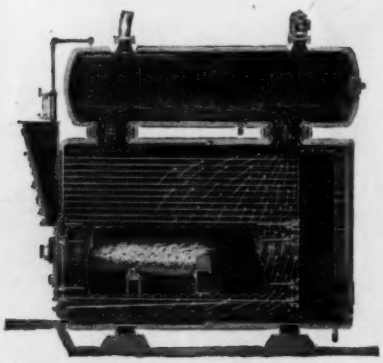
G-E Picker Motors are available in sizes from 3-h.p. to 15-h.p., and have various speeds to suit the machinery speeds. Suitable G-E Controllers can also be furnished for any motor application.

General Electric Co. Schenectady, N. Y.

GENERAL ELECTRIC

44-47

More Dry Steam With Less Fuel



HERE'S a perfect Scotch Boiler—a boiler that will generate more steam with less fuel.

Rapid, unrestricted circulation is absolutely necessary to the efficiency of any boiler, and while this feature is claimed for by many boiler manufacturers, the design of this boiler is such that it is positive at all times.

Large overload capacity, dry steam generated, and the remarkable flexibility of meeting fluctuating demands particularly adapts this boiler to severe conditions in industrial mills and plants.

Greatest economy is assured because of the circulating passage, which delivers water from the front neck to the bottom of the shell.

A constant temperature is assured because of this circulation which relieves uneven strains and stresses on this type of boilers.

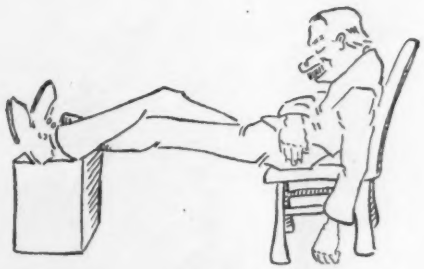
There are no troublesome brick settings, as the boiler is self-contained and is ready for operation upon delivery.

Write today for detail information.

INTERNATIONAL ENGINEERING WORKS, Inc.
FRAMINGHAM, MASS.

Southern Representative, Isaac Hardeman, Charlotte, N. C.

BOSTON
PHILADELPHIA
NEW YORK
SAN FRANCISCO



All the Same —in the long run

There is little difference between the man who leans back and deliberately neglects his electrical equipment, and the man whose intentions are right, but who is prevented from inspection and repair by rush orders and a busy shop. In either case, trouble is accumulating for the future.

The importance of renewing wearing parts before they reach the danger point, is acknowledged in modern factory management. Inspection and renewal is rigidly observed. It is the very foundation upon which rests the certainty and the security of the production program.

When Westinghouse stock parts are made, it is not known which will be used in the construction of new apparatus and which will go to the field as renewal parts. Therefore, Westinghouse renewal parts cannot be other than genuine—exact duplicates of the parts in the machine you buy. Keep them on hand, and by periodical renewal, be ready for any contingency.

Westinghouse Electric & Manufacturing Company
East Pittsburgh Pennsylvania
Sales Offices in All Principal Cities of the
United States and Foreign Countries

W
WESTINGHOUSE ELECTRIC

Westinghouse

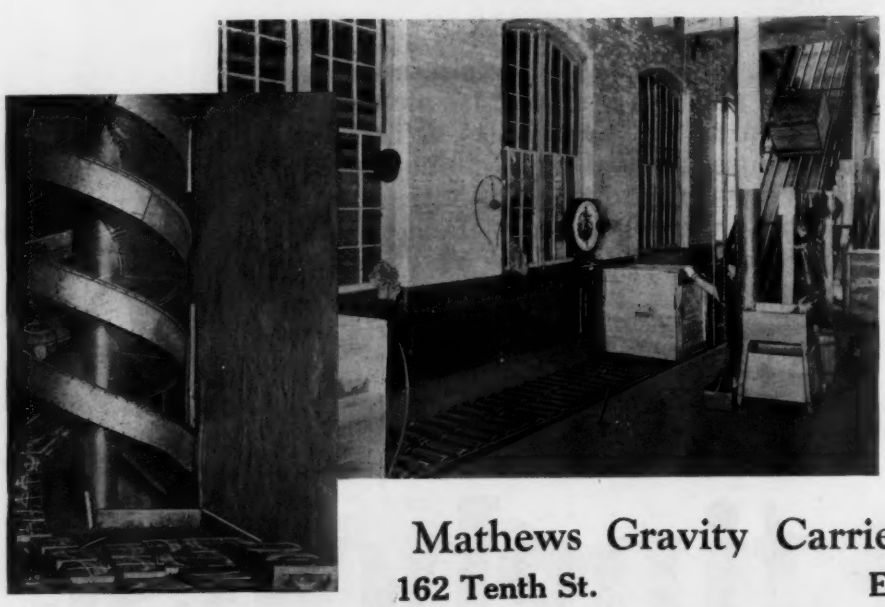
Soup or Cloth

Pictured above are three views of a modern conveying system for handling certain famous brands of soup. Below are two views of an equally large system handling 800-pound boxes filled with bolts of cloth.

Both are Mathews Systems.

We associate these two systems here to show that while in character the two industries are widely dissimilar, the handling problems in each are not nearly so divergent. In other words all products look pretty much alike when they are packed for shipment. The textile trades do, however, have some problems that are unusual and apparently difficult of solution. Such problems are being solved every day. Expert conveyor engineers are doing wonderful things for all classes of industries. Textile plants have afforded a particularly good field in which to apply the many advantages of mechanical handling. No matter what it is, light bobbins or heavy rolls or bales, a Mathews engineer will work out the problem of handling them mechanically.

40 Men and 700 Trucks Released.



That's what a Mathews Eight Thousand Dollar Conveying System accomplished in a Baltimore factory. The net saving per year is $47,400.00. The system is paying for itself every sixty days. Besides, 7,000 square feet of floor space has been released for other uses.

Personal Engineering Service

is promptly given all inquiries— — without cost or obligation.

Send for general catalog.

Mathews Gravity Carrier Company

162 Tenth St. **Ellwood City, Pa.**

Truck History is the Key to Sound Buying

Be sure the maker of the truck you buy is going to stay in business. This was never more important than it is today.

Stability is being sought for by nations as the key to prosperous, profitable years. The stability of its maker must be your key to prosperous, profitable years with the truck you buy.

Truck history reveals the importance of maker stability. Thousands of orphan trucks have been left almost valueless in the hands of owners. These orphans are the trucks made by the more than 500 truck makers who lacked stability—who have quit manufacturing trucks.

Truck history also reveals the steady rise of The White Company to the position of leadership which it has so long held. This leadership is a responsibility. It has not been acquired by chance. Chance cannot hold it.

In the White factory thousands of contented, well-paid artisans are conscious of their responsibility. With pride in their product they are daily contributing to White leadership. It is a daily challenge to them to build right.

Next, Whites are sold right.

"Build the best you can, add to your cost a fair profit, and your purchaser's satisfaction will be complete and enduring." That policy, laid down by the late Thomas H. White more than a score of years ago, has been handed down to two generations of Whites. Unchanged, it is White policy today.

And The White Company's interest in a buyer does not die with the delivery of a truck. The White Company has spread the boundaries of its factory yard throughout the world. Wherever duty calls and whatever the need, White Trucks are never far from interested care. Needs of the oldest White Truck are still adequately provided for.

Proof that White Trucks are made right, sold right, and kept rolling is the 100,000-mile record, published every Fall—a history in itself, of mileages in multiples of 100,000 attained by so many White Trucks of all models under all conditions that 100,000 earning miles has become a performance standard. The proof is in the Roll Call of White Fleets of ten or more, published every Spring—another history in itself, of the unfailing ability of one White Truck to sell another and another until many fleets number their Whites in hundreds.

Let truck history guide your purchase, whether you need one truck or a fleet.

Buy White Trucks and know that every dollar is buying you assured, sustained transportation.

Assuring continuous, sustained transportation everywhere

Spend all of your transportation dollar for transportation

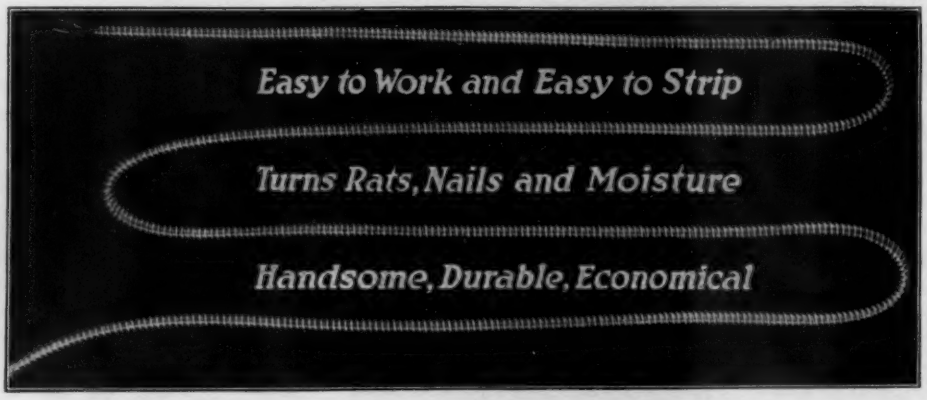
ULTIMATELY you will demand the profit in motor transportation supplied by White Trucks. All of your transportation dollar buys transportation when you buy a White.

Each year more and more truck buyers quit shopping for motor trucks and buy assured transportation from The White Company.

Their White Trucks go on adding to the White performance records which already surpass in scope and volume any other motor truck records.

THE WHITE COMPANY
CLEVELAND

WHITE TRUCKS



FOR transmission of current in cotton mills, plants, factories and all establishments in which strenuous service is demanded,

Realflex Steel Armored Cable

has no superior. In the matter of safety and dependability it stands alone.

REALFLEX can be obtained in many sizes and with many different arrangements of the conductors. It is carried by Electrical Jobbers everywhere.

The Youngstown Sheet & Tube Company

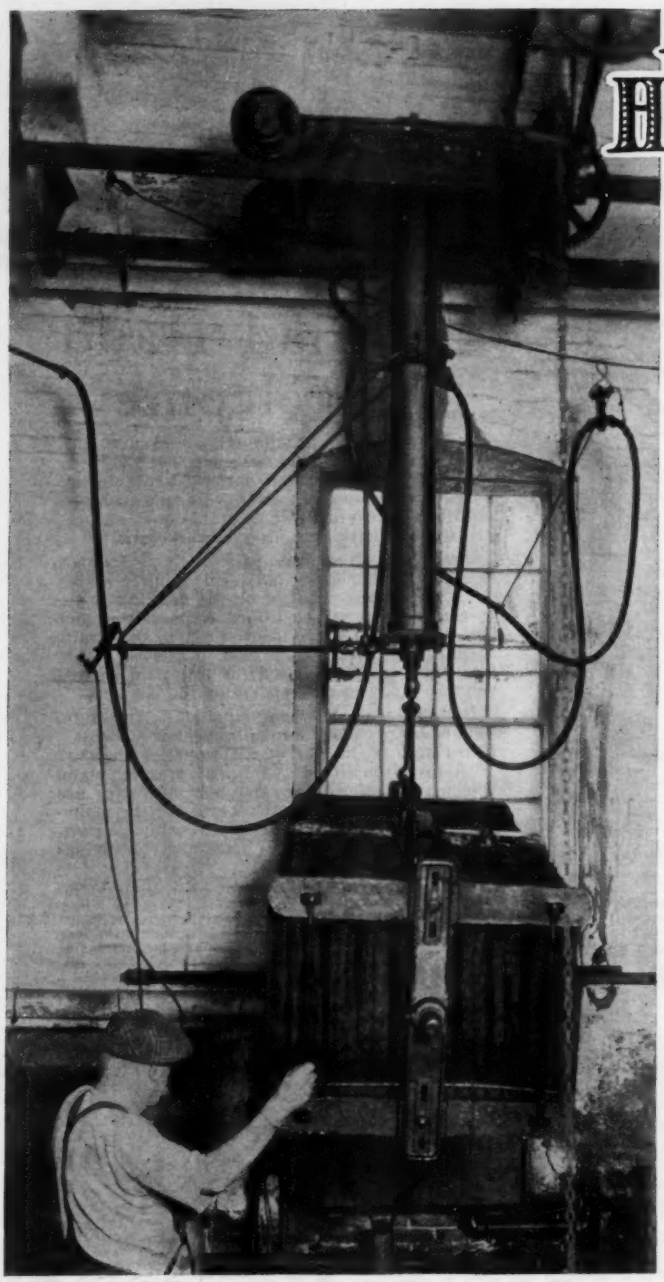
Youngstown, Ohio

District Sales Offices

BOSTON—120 Franklin St.
NEW YORK—30 Church St.
PHILADELPHIA—Franklin Trust Bldg. 1506 Chestnut St.
ATLANTA—Healey Bldg.
PITTSBURGH—Oliver Bldg.
CLEVELAND—1038-40 Hanna Bldg.
DETROIT—2021-2022 First National Bank Bldg.
CINCINNATI—1634-35 Union Trust Bldg.
CHICAGO—Conway Bldg.
ST. LOUIS—1139 Olive St.
DENVER—First Nat'l Bank Bldg.
DALLAS—1401-2 Magnolia Bldg.
SAN FRANCISCO—604 Mission St.
SEATTLE—Central Bldg.
KANSAS CITY, MO.—1398 Commerce Bldg.
MINNEAPOLIS—608 Andrus Bldg.
NEW ORLEANS—701 Maison-Blanche Bldg. Annex.

CURTIS

AIR HOISTS



Used in The Textile Industry

Curtis one man All Steel Air Hoists and Curtis Roller Bearing Trolleys are effecting important economies in leading textile mills throughout the country.

Why not install a Curtis Air Hoist and operate it with the air you now have available? The wide variety of uses to which Curtis equipment can be most economically applied is worthy of your immediate investigation.

Curtis Pneumatic Machinery Company

1571 Kienlen Ave., St. Louis, Mo.

Branch Office

532-R Hudson Terminal, New York

CURTIS
AIR COMPRESSORS-HOISTS-TROLLEYS-CRANES
ST. LOUIS
Established 1854

Tennessee—The Heart of Industrial America

The Glad Hand of Welcome

Tennessee wants textile mills and not only extends a glad hand of welcome, but offers to prospective manufacturers lower manufacturing costs, better industrial conditions, and also the additional advantages of desirable land and requisite building materials at lower costs.

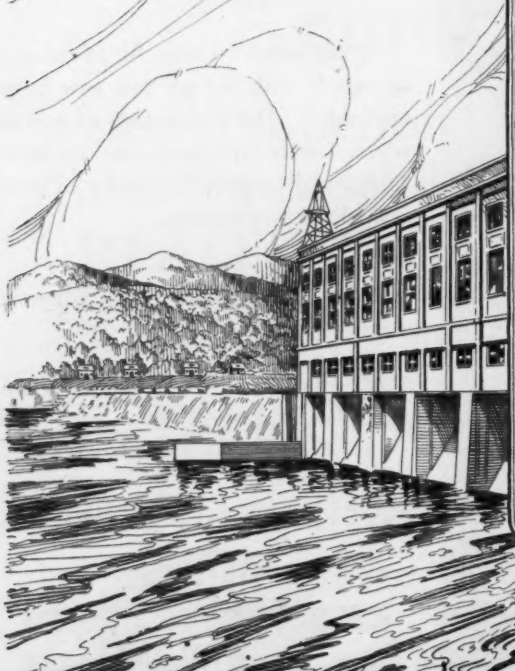
Ideal mill sites are available in scores of localities, either in or adjacent to progressive cities and towns or where mills desiring to do so can develop self-contained communities and mill villages. Land is convenient to both railroads and water routes and in general these localities can be procured for less than corresponding lands in other parts of the country.

Building materials are abundant in the state. Tennessee produces annually nearly 80,000,000 board feet of lumber of all varieties together with large quantities of brick, granite, slate, cement, and limestone, and her industries are well known throughout the world for the manufacture of boilers, castings, sewer pipe, alloys, and building and erection machinery of various kinds.

Construction material costs are lower owing to the nearness to the sources of production and the consequent saving in freight rates. Lower living costs insure labor for construction purposes cheaper than elsewhere. All of this means that not only are manufacturing conditions ideal for economic production, but the cost of building and equipping a mill is less in Tennessee.

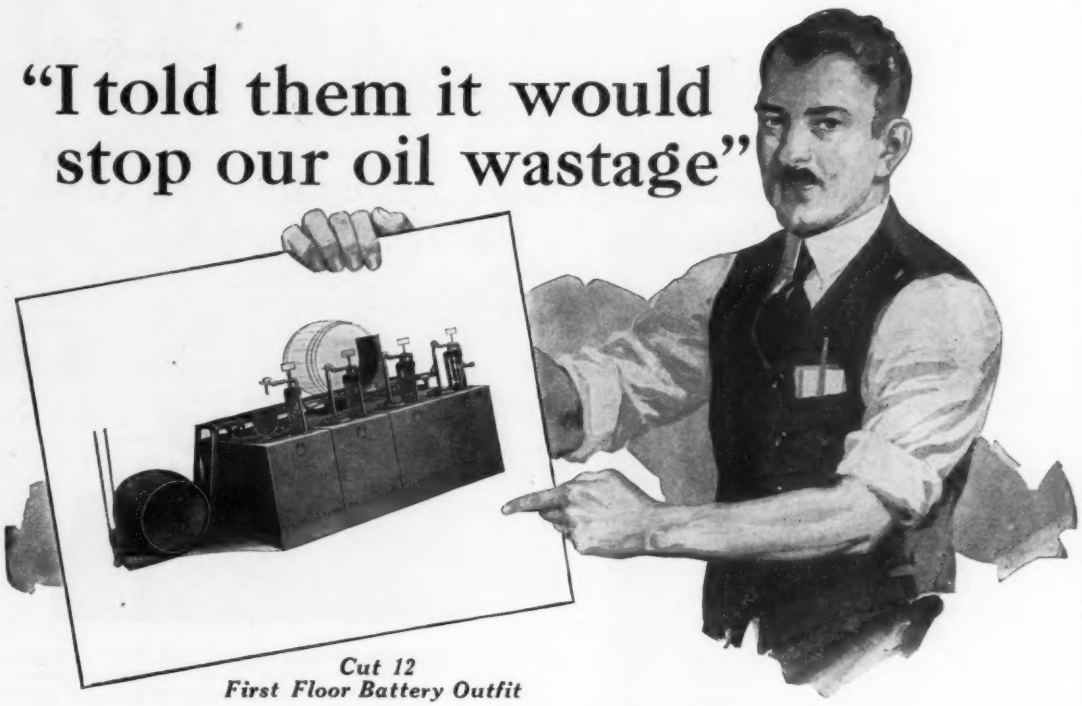
Write us today for further information regarding available industrial sites.

THE TENNESSEE ELECTRIC POWER CO.
CHATTANOOGA, TENNESSEE



The Tennessee Electric Power Co.

"I told them it would stop our oil wastage"



Cut 12
First Floor Battery Outfit

"They asked me, 'How can this American Oil Storage System PREVENT a waste of oil—when there is no waste in our plant?' I didn't try to argue with them—just insisted that they install it, if only for the saving it would make in TIME, and its CLEANLINESS and CONVENIENCE. Wasn't long before I showed them how we had been wasting HALF THE VALUE of our oils through gumming, evaporation, leakage, loss of men's time, higher insurance rates and loss of price margin by not buying in bulk."

Average Cases Show a 50% Oil Value Wastage Yearly

Careful checking has shown that 50 per cent of the value of oils is wasted through out-of-date methods. In some places this USELESS WASTE amounts to MORE than 50 per cent. PREVENTING this needless waste is SAVING money. And, the savings soon pay the cost of an American System. Install this MODERN WAY of storing and dispensing oils and insure CLEANLINESS, CONVENIENCE and EFFICIENCY.

Write us—let us, without cost, describe an American System to meet your special needs. Ask for Bulletin 203—tells how you can reduce oil wastage.

Cut 36, Pump with meter attached

A convenient manner for storing and serving oil into containers in exact quantities. Heavy, durable construction, discharges quart or pint at single stroke. *Ask for Bulletin* 400.

THE AMERICAN OIL PUMP & TANK COMPANY

1179 FINDLAY ST. CINCINNATI, OHIO

224-234
No. Water St.

WASHBURN
IF IT'S ROLLS, WE MAKE THEM

New Bedford,
MASS.

Shell Rolls, Beams, Top Rolls, Pin Boards and Other Special Products for the Textile Industry

SHELL ROLLS

Perfection Shell Rolls are a development of many years of practical experience. They are made in a great variety of sizes and of woods most practical for their various uses in bleacheries, ball warping, finishing plants, for cord fabric shipping, rubber plants, paper mills, etc. Wherever required we use end protection consisting of a patented flanged type galvanized steel bleachery ring that will never loosen or fall out.

Service—We deliver special sizes on 24 hours notice and make immediate shipments from stock on standard sizes of ball warp or cord fabric shipping rolls.

BEAMS AND GUDGEON ROLLS

We manufacture section beams, loom beams and gudgeon rolls in sizes up to 10 in. in diameter. Blue prints, specifications and quotations on request.

"ECONOMY" SECTION BEAMS

with interlocking, replaceable staves and all-metal interior construction represent a distinct advance in beam construction.

No other beam on the market possesses the advantages and durability of this improved type. The shaft is easily removable for staightening. This feature has been included at a minimum of expense in a most simple manner.

WOOD TOP ROLLS

Washburn Wood Top Rolls are designed by practical mill men to make good yarn better, reduce operating costs and increase production.

They are proportioned from wood, steel, felt and sheepskin to absolutely eliminate cockles and fly waste, satisfactory results obtaining even on mixed staple.

They are used as intermediate top rolls on any spinning frame without necessitating new saddles or cap bars. No change of setting is required for various numbers or staples.

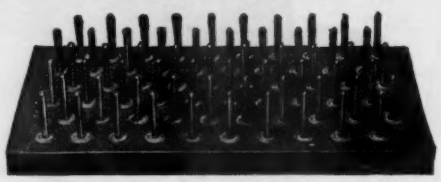
Their use in leading mills attests their practical value.

Test Frame—We have an attractive offer for equipping test frames. Write for particulars and descriptive circulars.

PIN BOARDS

KORE-LOKT PIN BOARDS
TRADE-MARK

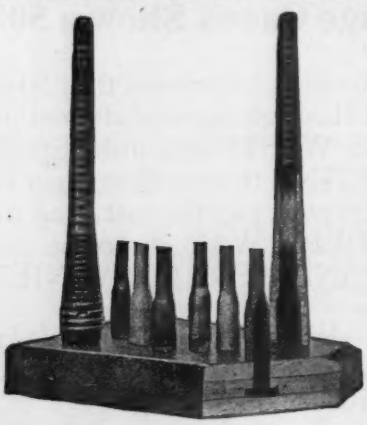
"Kore-Lokt" Pin Boards are made in various types to meet every doffing requirement throughout the mill. They are used for handling yarn on cops, tubes, quills, bobbins or spools and are extensively used on looms in place of the old-fashioned bobbin boxes.



Construction—Nearly every mill has at some time conceived the value of pin board practices and nearly every one has considered a board with nails in it all that was required. In practice, however, the boards split and the nails bend, loosen and fall out—dowel type boards have discouraging breakage and in fine, a truly economical pin board calls for "some engineering" based on long experience and practical tests.

"Kore-Lokt" pin boards, as the name implies, have the core-locked feature in every type. Three ply construction from sawn veneers, hollow or solid steel pins of various sizes, specially designed wood and wire pins, always core-locked are distinctive "WASHBURN" features.

Advantages—One patent feature has led to another until we are in a position to point to scores of satisfied users who find "Kore-Lokt" pin boards practically indestructible and therefore most economical.



Pin boards obviate waste in yarns from rough handling, oil stains, etc., and lend themselves to systematic tally of orders or mill processes.

Let us solve your pin board problem; our time and advice are yours for the asking.

Special circulars on request.

TRUCKS

We manufacture trucks for all textile purposes. Our special all-metal trucks are recommended for handling pin boards.

WASHBURN—NEW BEDFORD, MASS.

Skilled Experience

Tells Tanks and Pumps What to Do!

The actual tanks and pumps supplied as part of Bowser engineering service are really the least part of our help—it is the experience of 39 years, that tells how Bowser products are to be used, that counts!

Bowser has made hundreds of installations in textile mills of all sizes, employing all grades of labor, under all climatic and atmospheric conditions. This experience insures minimum investment in equipment—maximum results on oils.

Without obligation to you, we will undertake to prove to you, with exact figures, how soon a complete Bowser outfit will pay for itself in oil saved. The increased life of your machinery, the decreased fire hazard, the saving in labor—these three items are by-products whose value is generally greater than the oil saving itself.

Find out what Bowser can do for you. Please address Dept. A45.

S.F. BOWSER & COMPANY, Inc.

Dependable Pumps and Tanks

FORT WAYNE, INDIANA, U.S.A.

Sales and Service Representatives All Over The World

BOWSER ESTABLISHED 1885

WILLIS A. SUTTON, SUPERINTENDENT — H. REID HUNTER, ASSISTANT SUPERINTENDENT — MARY W. POSTELL, ASSISTANT SUPERINTENDENT — R. L. McCULLOUGH, BUSINESS MANAGER

OFFICE OF
BOARD OF EDUCATION
AND
SUPERINTENDENT ATLANTA PUBLIC SCHOOLS
ATLANTA, GA.

Southern Theatre Equipment Co.
Atlanta, Ga.

Gentlemen:--Regarding the educational value of the motion picture in public schools, I wish to call your attention to the following points:

1, 2, 3, 4, and 5--(see previous ads)

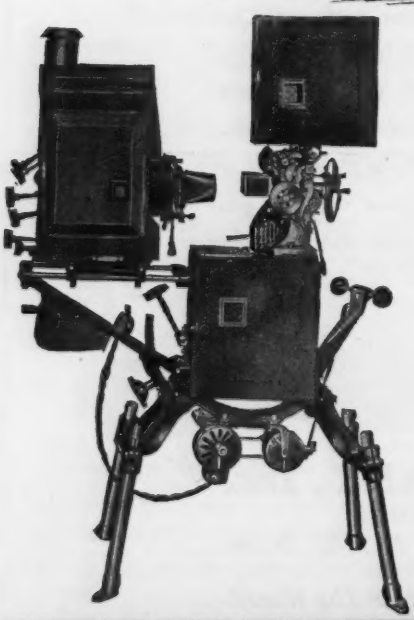
6.- PROCESSES ARE SHORTENED AND SIMPLIFIED, allowing pupil (in this case, his mind) to accomplish a given task with less labor, do more work in less time, and approach each task with less fatigue and more enthusiasm.

A letter from a man who knows

You may use any or all of this letter as you desire.

Very truly yours,

Joe W. Coffman
Supervisor, Visual Instruction,
Atlanta Public Schools.



VISUAL EDUCATION with the motion picture has already proven its value in city schools, and it will prove of even greater value in village and community schools because it accomplishes even greater results with less time and less experienced teachers.

Through the courtesy of Mr. Coffman, we are presenting each month in paragraph form, parts of a very enlightening letter which he has written us, and through Mr. Coffman also, we are able to give our textile mill friends valuable help and suggestions regarding the use of this system in community school work, the selection of the proper films, in fact the solution of every problem which may present itself.

Our service to textile mills is the result of years of experience, and we have installed Powers Motion Picture Projectors and theatre auditorium equipment in over 60 Southern mills. Whether it be a visual education system or complete motion picture theatre equipment, including screens, chairs, cooling systems, etc., we are ready to take the problem off your hands and turn the system back to you ready for operation.

May we present our special proposition to you?

Southern Theatre Equipment Company

WILLIAM OLDKNOW, President.

100 WALTON STREET
ATLANTA, GEORGIA

THREE TWENTY-EIGHT CALIFORNIA ST.,
OKLAHOMA CITY, OKLA.

1907 COMMERCE ST.
DALLAS, TEXAS

THE FUN-FUL LINE
PLAYGROUND EQUIPMENT

349 Cotton Mills Using FUN-FUL!

A few of them

Pacific Mills—Columbia, S. C.
Columbia Mills—Columbia, S. C.
Wymojo Mills—Rockhill, S. C.
Woodside Mills—Greenville, S. C.
Pacolet Mills—Pacolet, S. C.
Drayton Mills—Spartanburg, S. C.
Monarch Mills—Union, S. C.
Langley Mills—Langley, S. C.
Grendel Mills—Greenwood, S. C.
Greenwood Mills—Greenwood, S. C.
Belton Mills—Belton, S. C.
Loray Mills—Gastonia, S. C.
Gray Mills—Gastonia, S. C.
Arlington Mills—Gastonia, S. C.
Flint Mills—Gastonia, S. C.
Cannon Mills—Kannapolis, N. C.
P. H. Hanes Mills—Winston-Salem, N. C.
Proximity Mills—Greensboro, N. C.
Durham Mills—Durham, N. C.
Roxboro Mills—Roxboro, N. C.
Tolar-Hart-Holt Mills—Fayetteville, N. C.
Hart Mills—Tarboro, N. C.
Pilot Mills—Raleigh, N. C.
Cardinal Mills—West Point, Miss.
Lauderdale Mills—Meridian, Miss.
Danville Mills—Danvillle, Va.
Schoolfield Mills—Schoolfield, Va.
Bonham Mills—Bonham, Texas.
Sherman Mills—Sherman, Texas.
Corsicana Mills—Corsicana, Texas.
Itasca Mills—Itasca, Texas.
Brazo Valley Mills—West, Texas.
Prendergast Mills—Prendergast, Tenn.
Davis Mills—Chattanooga, Tenn.
Avondale Mills—Birmingham, Ala.
Lanettt Mills—Lanett, Ala.
Anniston Mills—Anniston, Ala.
Montgomery Mills—Montgomery, Ala.
Fulton Bag Mills—Atlanta, Georgia.
Exposition Mills—Atlanta, Georgia.
Calloway Mills—LaGrange, Georgia.
Moultrie Mills—Moultrie, Georgia.
Trion Mills—Trion, Georgia.
LaFayette Mills—LaFayette, Georgia.
Bibb Mills—Macon, Georgia.
International Mills—LaGrange, Georgia.

At the Brazilian Centennial Exhibition at Rio de Janeiro, Brazil, South America, which has just closed, HILL-STANDARD Equipment was awarded the gold medals.

Catalog on request

HILL-STANDARD CO.

Anderson, Our 23rd year Indiana

If It's A Broadside—

If it is an especially large illustration for an especially large piece of literature, chart, birds eye view, map, etc. Whether it be in one or more colors, our plant is equipped to supply your needs. No halftone or line plate too large or too small for our equipment.

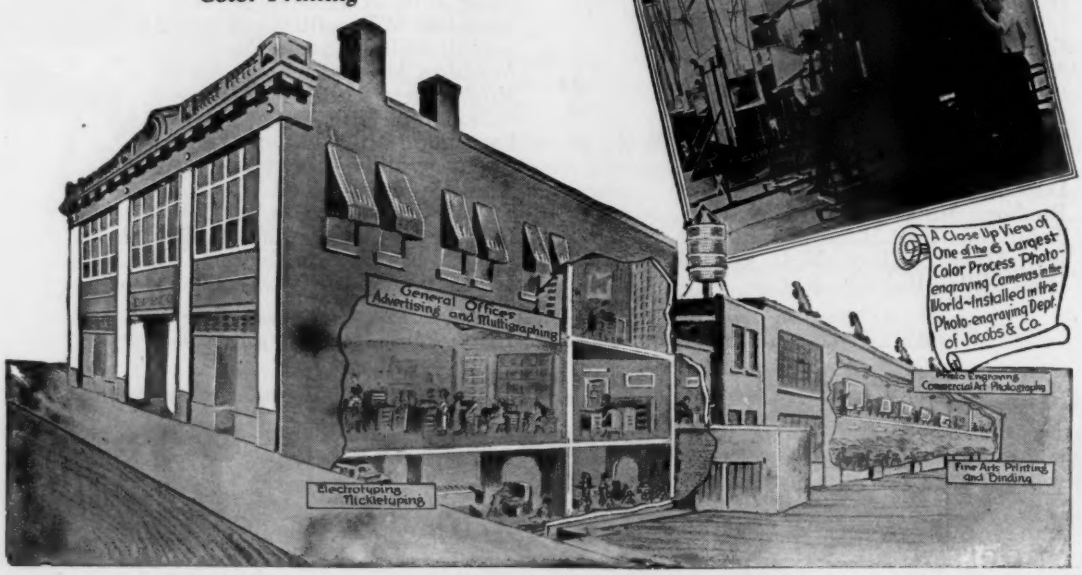
Illustrating Your Literature

Sometimes in the preparation of your sales and advertising plans you find the need of some especially prepared piece of literature, the execution of which will baffle your photographer, electrotyper and printer. Frequently you may seek a service that the ordinary plant cannot give.

Our plant is designed and equipped for the accomplishment of many difficult products that cannot be secured from most photo-engraving establishments; is equipped to furnish the best of photo-engraving, electrotyping, printing, nickeltyping, commercial art and allied service, whether large or small, whether one or more colors. The extent of our equipment is reflected in the large process camera, which can furnish you with process color plates as large as a yard square. One of the 6 largest in the world. If you have an idea you wish carried into execution, we are at your service. We will gladly perfect it and illustrate it.

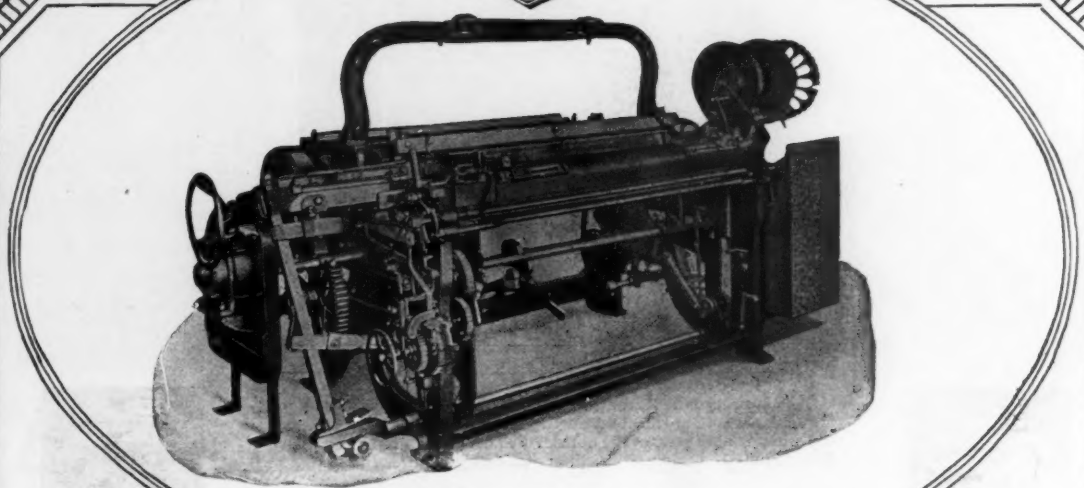
Battery of Cameras in the Photo-Engraving Department

A Close Up View of One of the 6 Largest Color Process Photo-engraving Cameras in the World—Installed in the Photo-engraving Dept. of Jacobs & Co.


General Offices Advertising and Multigraphing
Photo Engraving Commercial Art Photography
Fine Arts Printing and Binding
Electrotyping Nickeltyping

Jacobs & Company
Clinton, S. C.

Advertising, Commercial Art
Photo-Engraving—Electrotyping
Nickeltyping
Color Printing



Stafford bobbin-changing plain goods loom.

Stafford Looms Increase Production

We manufacture a complete line of automatic looms, both shuttle and bobbin-changing for weaving practically every type of fabric that can be made with a single shuttle. ¶ Stafford shuttle-changing looms will handle cop filling just as successfully as bobbin filling. We have a loom for every kind of yarn, coarse or fine, and for practically every variety of fabric, plain or fancy.

THE STAFFORD COMPANY

WEAVING MACHINERY

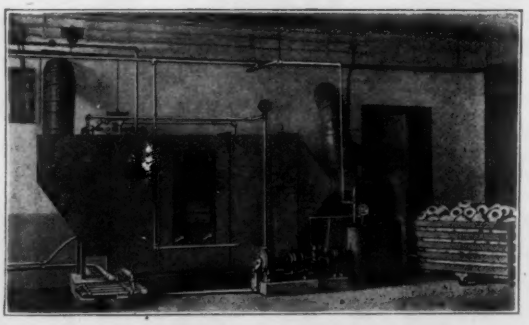
READVILLE, MASS.

Branch Office
502 Colt Building
Paterson, N. J.

Southern Agent
Fred H. White,
Charlotte, N. C.

Canadian Representative
Whitehead, Emmans, Limited
Montreal

AUTOMATIC
STAFFORD
LOOMS



Yarn is stored and conditioned for about 12 hours in the room on the other side of this partition

Before

Reelings of Yarn taken direct from cone before conditioning.

This apparatus heats the air very hot, produces a high humidity and circulates it in the conditioning room. The high heat softens the waxy constituent of the cotton. The humidity sets the twist. The rapid circulation of air eliminates free moisture.

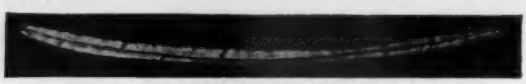
Conditioned Yarn

makes friends, whether you use it yourself or sell it

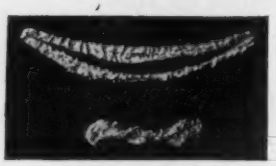
After

Reelings taken from same cone after treatment 12 hours 95° F 98° RH.

Same Reelings—Note tension required to eliminate kinks

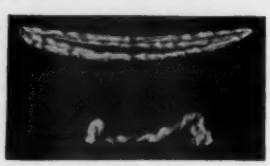


Conditioned—and twist stays but snarls and kinks go.



Other Samples

These photographs were made not by us but by a customer who had operated our conditioning apparatus for five months. They represent his actual and current practice on a production basis.



Other Samples

Textile mills producing sales yarn, especially hosiery yarns, knitting mills and hosiery mills find this apparatus particularly helpful.

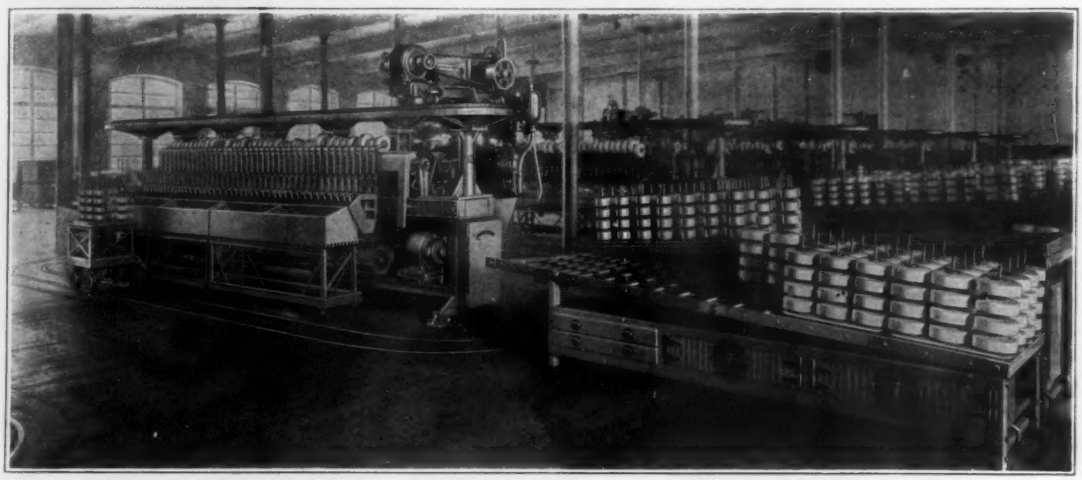
There is more on this subject in our Bulletin 322

Parks-Cramer Company

Engineers & Contractors

Industrial Piping and Air Conditioning

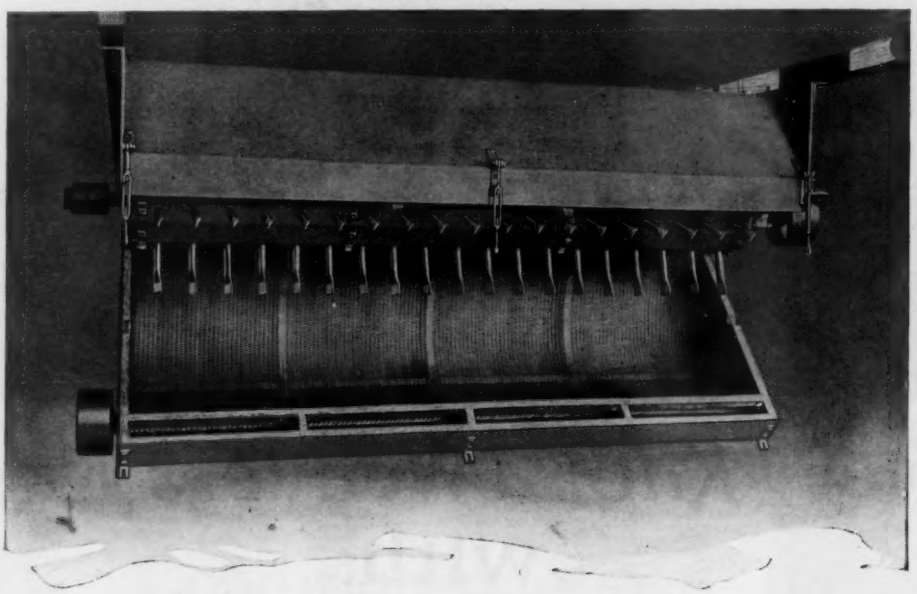
Fitchburg Boston Charlotte



"Every Knot a Weaver's Knot"
with
AUTOMATIC SPOOLERS
HIGH SPEED WARPERS

Increased Production
Lowered Cost
Better Weaving

BARBER-COLMAN COMPANY
BOSTON, MASS. GREENVILLE, S.C.
MAIN OFFICE AND PLANT
ROCKFORD, ILL. U.S.A.



Put Your Conveyor Pipe to Work

You can give your cotton a thorough cleaning, opening and aerating, while it's being conveyed from the bale breakers to the picker room. The Murray Cotton Cleaning and Aerating Machine forms a part of the conveyor pipe, and vastly improves the stock before it is fed to the pickers.

The "Murray" takes up very little extra space since it can be hung from the ceiling. Its supply of cotton is drawn through it by the suction of the conveyor pipe fan, no additional fan or increased draft being necessary. A further economical feature is the fact that the "Murray" requires practically no attention since the dirt is automatically disposed of through a chute at one end.

Handles 2,500 Lbs. Hourly.

2,500 pounds of cotton per hour can be cleaned, opened and aerated in the Murray machine at a power expenditure of only 3 to 5 H.P. The stock is given a thorough treatment by 114 revolving arms.

The Bowling Green Spinning Mills write us stating "The Opener we purchased from you is giving entire satisfaction in every way. In fact we think it is a wonderful machine."

THE MURRAY COMPANY, ATLANTA, GA.

Northern and New England Sales Representatives:
Aldrich Machine Works
P. O. Box 132, Providence, R. I

Carolina Sales Representatives:
Carolina Specialty Co.
Brevard Court
Charlotte, N. C.

The Murray (PAT. PENDING)
COTTON CLEANING AND AERATING MACHINE

COTTON WELL OPENED IS HALF SPU N

RICHARDSON Product

From the makers of Flex-a-tile Housetops, Viskalt Membrane Roofs, Viskote, and similar products

The Richardson Multicrome Roof in Opal, shown on the Colonial House designed for House Beautiful *magazine by Henry Atherton Frost and Eleanor Raymond of Cambridge, Massachusetts*

Newly created by Richardson

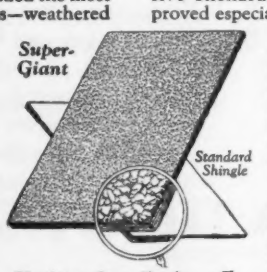
—*an* opal *roof of exclusive beauty from blended colors in slate*

An *opal* roof of a beauty hitherto unknown has now been created by Richardson.

This roof is built from the new Richardson opal shingles, no two of which are alike. On each are blended the most beautiful Richardson colors—weathered brown and jade green.

When these shingles are applied, just as they come from the bundle, the result is a delicately mottled coloring, like the play of light on a rippled mountain lake.

Both architects and home owners who have seen this effect agree that it is the most distinctive of the color combinations in Richardson Multicrome Roofs.



The Super-Giant Shingle—50% thicker, 100% more rigid, and 35% more economical in cost of laying

The Richardson Multicrome Roof

In addition to opal, the Multicrome Roof is laid in other pleasing color effects.

The rare *weathered brown*, an exclusive Richardson color in slate, has proved especially popular when applied in combination with other Richardson shingles of *jade green, tile red,* or *black pearl.* In fact, there is a Multicrome Roof to harmonize with every color scheme, and to please every customer's taste.

The new colors, opal and weathered brown, are used only on the Richardson Super-Giant Shingle—famous for its beauty and economy.

With its inner foundation of Richardson felt, for fifty years recognized as the best; coated and saturated with Viskalt, the vacuum-processed waterproofing, 99.8% pure bitumen, the Super-Giant assures you *lasting* beauty for your roof.

Richardson Multicrome Roofs are equally practical for new or over-the-old-roof jobs. And remember—for every roofing need there is a Richardson product.

Write for our new booklet

We will send you our new booklet, *Roofs of Distinction,* together with samples of Richardson Super-Giant Shingles in opal, weathered brown and other colors. Just use the coupon below.

The RICHARDSON COMPANY

Lockland (Cincinnati), Ohio

Chicago New Orleans Atlanta New York City Dallas

RICHARDSON ROOFING

© 1924, The Richardson Company

Clip and mail this coupon

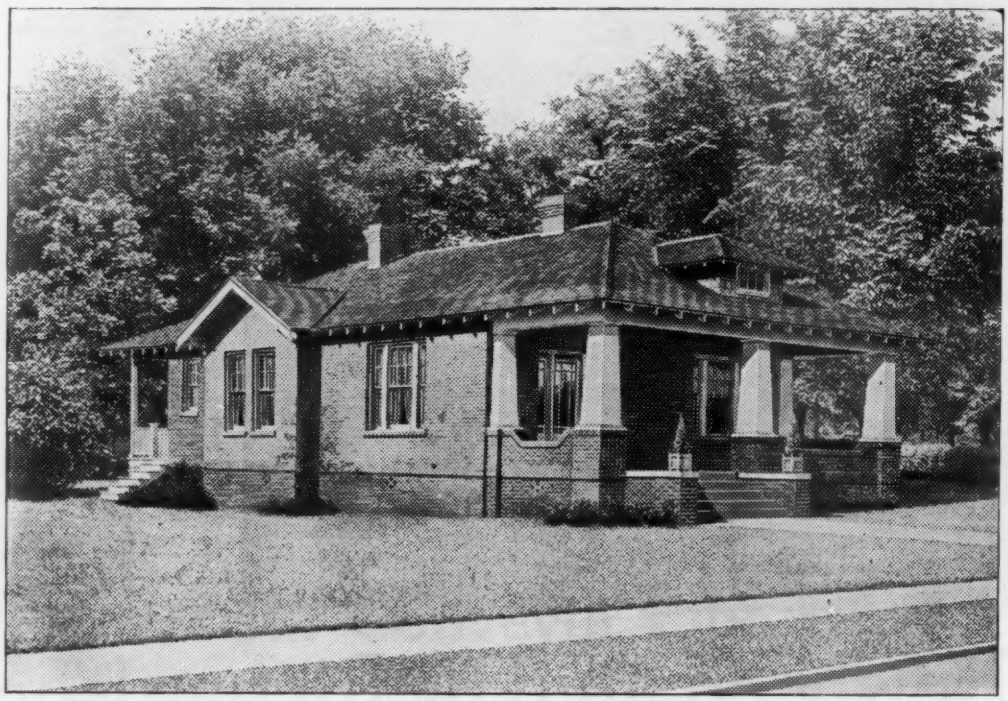
The Richardson Company
Dept. 44-L, Lockland, Ohio
Gentlemen:

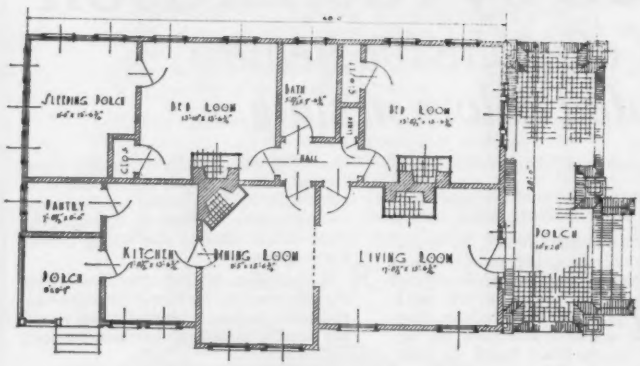
Please send me samples of Richardson Super-Giant Shingles, your new booklet, and further facts about Richardson Roofing.

Name .....

Address .....

We Handle Every Building Detail





FLOOR PLAN
of the Minter Home Illustrated Above

Type of Minter Home selected for Superintendent's Residence by a leading Textile Firm. Exterior finish of this attractive home may be either brick veneer, as shown, or in wood.

You are delivered completed homes when you place your housing in our hands. Only one contract is necessary.

No matter what your building needs may be—one and two-story community houses, churches, stores, school houses, moving picture theatres, apartment houses or other structures—you can have them erected in exact accordance with your plans or those of your architect without being troubled by any detail.

All Minter structures are built of the best materials of the kind specified, are erected in minimum time and without loss of time, labor or materials.

The Minter System is the modern method of building that saves your time, your nerves and the money of you and your stockholders.

Write us today about the houses you need.

THE MINTER HOMES CO.
GREENVILLE, SOUTH CAROLINA

MINTER HOMES CORPORATION
HUNTINGTON, WEST VIRGINIA

SERVICE *of special value*

to the Textile Industry

The textile industry has seen many changes in the past half-century. Methods have been revolutionized, new processes and machinery substituted for old.

Yet in the face of these changes, there are textile mills in New England, in the South and in the Middle West that have kept pace. They are to-day as up-to-date as the day they were originally designed. With the help of intelligent and constant engineering service they have made the changes with a minimum of delay and expense, for these mills were *Built with Foresight.*

Lockwood, Greene & Co., through ninety-two years of varied ever-progressive experience in industrial engineering, have been in especially close association with the textile industry. Through their service they have had a share in the very improvements that have marked its growth. Their organization of engineers, architects, financial men and mill managers have had a part in the up-building of the industry.

Lockwood, Greene & Co. are especially prepared to meet any problem of mill construction or textile manufacturing. Their service is complete, including the valuation of properties for financial purposes, for inventory or taxation.

A copy of "Building with Foresight," a booklet descriptive of Lockwood-Greene achievements, will be sent on request.

Building With Foresight

LOCKWOOD, GREENE & CO.

ENGINEERS

EXECUTIVE OFFICE, 24 Federal Street, BOSTON 9

BOSTON ATLANTA CHICAGO NEW YORK
DETROIT CLEVELAND CHARLOTTE

Lockwood, Greene & Co. of Canada, Limited, Montreal

Compagnie Lockwood Greene, Paris, France

ROYAL PALM

TO

CINCINNATI
TOLEDO
CLEVELAND
DETROIT
GRAND RAPIDS
CHICAGO

Daily from Atlanta
6:20 A. M.

CITY TICKET OFFICE
48 N. BROAD ST.

SOUTHERN RAILWAY SYSTEM

SUWANEE RIVER SPECIAL

TO

CINCINNATI
CLEVELAND
CHICAGO
INDIANAPOLIS
DETROIT
LOUISVILLE

Daily from Atlanta
4:10 P. M.

CITY TICKET OFFICE
48 N. BROAD ST.

SOUTHERN RAILWAY SYSTEM

How the Judge learned something new about an every-day topic

THE writer was walking along the main street of an Ohio city with the judge of the county court who had travelled that street twice a day for 35 years. It was a brick-paved street carrying the heaviest traffic in the city. The pavement was somewhat rough, it is true, but it could still be travelled faster than twenty-five miles an hour without discomfort, or damage to an automobile.

"What's wrong with these brick pavements?" asked the judge. "They don't seem to stand up. Look at this, for instance,—terribly rough."

I replied with a question: "How old is this pavement, Judge?"

After some thought he guessed, "Now that I stop to think about it, these brick were laid about 30 years ago."

"33 years, to be exact," I corrected him, and then asked: "Are the brick worn out? Let's just step over to the curb and look at them. They seem a little bit cobbled on the edges. Aside from that they're still perfectly good brick, aren't they?" I continued.

"Yes," he admitted, rather surprised, "they are."

Further conversation revealed that he had never considered the age of the brick—although he was living on that street when it was originally paved. He had never thought of the base, or rather the absence of one. He admitted that he never had seen any one repairing the pavement.

The judge thanked me for opening up an untravelled avenue of thought and confessed that he had been favoring paving with another material.

With a little help he now recalled that another street in town had had two—"yes, by jove, THREE" of the other pavements on it since this main street was paved with brick 33 years before.

"Well, that makes an average of 11 years apiece for that type of pavement as against 33 years for the brick pavement that, a moment ago, you were so disgusted with, doesn't it, judge?" I prodded him.

"Yes, you're right," he confessed.

"Have you ever seen anyone patching that other type of pavement?" I pressed him.

"Yes, by golly, they patch that street every blooming spring," he almost shouted, by this time an ardent paving brick enthusiast.

"Well, judge, you wouldn't blame a hard wood floor if the joist gave way from under it, would you?"

No, of course he wouldn't. It was all perfectly plain to him now. No drainage, no foundation, no base. That was the trouble. These other pavements must really cost more in the long run than a person had any idea.

We figured out that enough had been spent on the substitute pavement on the other street—in spite of its lighter traffic—to buy two modern brick pavements.

Then the judge wondered whether brick pavements really didn't last too long. He suggested that if the brick would only wear out and expose the deficiencies below the surface, the average citizen would then place the blame where it belonged—on the lack of adequate and proper drainage, foundation and base.

"Judge," I said, "many cities are now taking up brick that have seen service from 20 to 30 years and relaying them, better face up, on a more modern foundation."

Then it came over the judge that such salvage value meant a real public paving economy, and he wished that his automobile contained the same measure of second-hand worth. But he penetrated to the meat of the cocoanut, when he concluded: "Come to think of it, the bond issue to pave this street was retired 13 years ago. I see what you mean when you say that brick pavements outlast the bonds."

Condensed from August 1923 issue of "Dependable Highways"

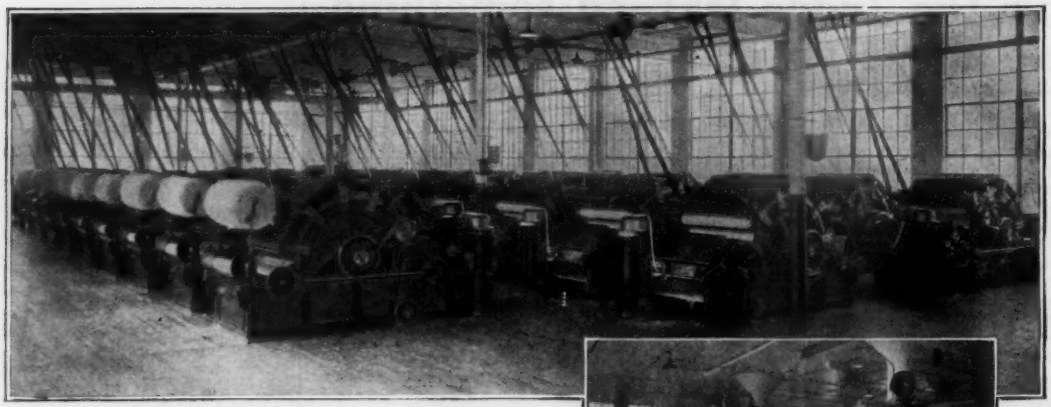
VITRIFIED **Brick** PAVEMENTS

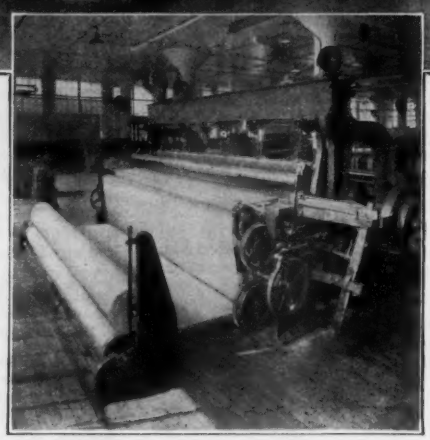
NATIONAL PAVING BRICK MANUFACTURERS ASSOCIATION
Engineers Bldg. Cleveland, Ohio

VITRIFIED **Brick** PAVEMENTS

Albion Shale Brick Company
Albion, Ill.
Alton Brick Company
Alton, Ill.
Barr Clay Company
Streator, Ill.
Binghamton Brick Company
Binghamton, N. Y.
Cleveland Brick & Clay Company
Cleveland, Ohio
Clydesdale Brick & Stone Co.
Pittsburgh, Pa.
Coffeyville Vitrified Brick & Tile Co.
Coffeyville, Kans.
Collinwood Shale Brick Company
Cleveland, Ohio
Corry Brick & Tile Company
Corry, Pa.
Francis Vitric Brick Company
Boynton, Okla.
Georgia Vitrified Brick & Clay Co.
Augusta, Ga.
Globe Brick Company
East Liverpool, Ohio
Hammond Fire Brick Company
Fairmont, W. Va.
Hocking Valley BrickCompany
Columbus, Ohio
Independence Paving Brick Co.
Independence, Kans.
Mack Mfg. Company
Wheeling, W. Va.
C. P. Mayer Brick Company
Bridgeville, Pa.
Medal Paving Brick Company
Cleveland, Ohio
Metropolis Paving Brick Co.
Pittsburg, Kans.
Metropolitan Paving Brick Co.
Canton, Ohio
Mineral Wells Paving Brick Co.
Mineral Wells, Texas
Moberly Paving Brick Company
Moberly, Mo.
Murphysboro Paving Brick Co.
Murphysboro, Ill.
Patton Clay Mfg. Company
Patton, Pa.
Peebles Paving Brick Company
Portsmouth, Ohio
Pittsburg Paving Brick Company
Pittsburg, Kansas
Purington Paving Brick Company
Galesburg, Ill.
Southern Clay Mfg. Company
Chattanooga, Tenn.
Springfield Paving Brick Company
Springfield, Ill.
Sterling Brick Company
Olean, N. Y.
Streator Clay Mfg. Company
Streator, Ill.
Thornton Fire Brick Company
Clarksburg, W. Va.
Thurber Brick Company
Ft. Worth, Texas
Toronto Fire Clay Company
Toronto, Ohio
Trinidad Brick & Tile Company
Trinidad, Colo.
Veedersburg Paver Company
Veedersburg, Ind.
Western Shale Products Company
Fort Scott, Kans.
Westport Paving Brick Company
Baltimore, Md.

PAVEMENTS OF
VITRIFIED
Brick
OUTLAST THE BONDS





Card room in Brandon Mills Duck Plant, Greenville, S. C., and one of the 208-inch looms.

The New Brandon Mills Duck Plant

THE new mill built by the Brandon Mills, Inc., at Greenville, S. C., is equipped for the manufacture of duck ranging in weight from No. 12 to 12/0 and in width from 12 to 192 inches.

The product is used as paper mill felts, sail duck, hose and felt duck, canvas duck and conveyor belting duck.

The machinery equipment includes 5,712 ring spindles, 1,324 twister spindles and 46 looms which varv in size from 32 to 208 inches.

The plans and specifications for the entire plant as well as the supervision of the construction and equipment was the work of this organization of Engineers.

Foresight rounded out by an experience of nearly a quarter-century has enabled us to build up an organization competent to assist nearly every branch of industry.

A member of this organization will confer with you, without obligation, to discuss your present and future plans. Your request for the appointment will receive prompt attention.

J. E. SIRRINE & COMPANY
Engineers
Greenville South Carolina

Write

for the new editions of "Picks to the Minute"—a short discussion of the textile industry—and "Factories for the Future."

Quality Proved
by Years of Service

Today it is the accepted rule that mill interiors should be painted white.

But, when you paint your walls and ceilings white, be very sure they will stay white---not for six months or a year---but year after year.

Sta-White---in many plants---applied ten years ago is still giving service.

The use of Sta-White eliminates the expense and the necessity of frequent repaintings. The mill-white paint of proven quality always costs less in the long run.

When you think of white paint, it will pay you to remember Sta-White---it stays white.

DEGRACO PRODUCTS

Superior Graphite Paint
Sta-White
Degraco House Paint and Varnish
Degraco-Tone-*Flat wall finish*
Degraco Brick and Concrete Paint
Anti-Aqua-*Damp-proof coating*
Degraco Gas Holder Paint
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Degraco Enamels
Industrial Finishes

(211)

DEGRACO PAINTS
All Colors for Your Particular Needs

MADE BY

Detroit Graphite Company

517 Twelfth Street

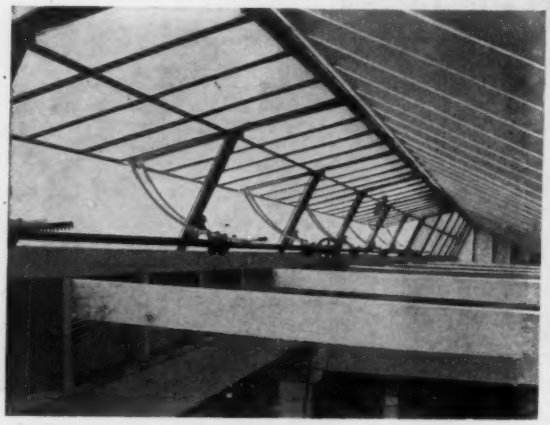
Manufactured in Canada by Dominion Paint Works, Limited, Walkerville, Canada.

DETROIT U.S.A.

DEGRACO PAINTS are sold through branch offices with warehouse stocks in all principal cities.

GEORGE DOWMAN

610-611 Walton Building, Atlanta, Ga.



Better Ventilation

Plenty of fresh air without draft or dust is a wonderful stimulus to production. Both old and new buildings may be easily equipped with

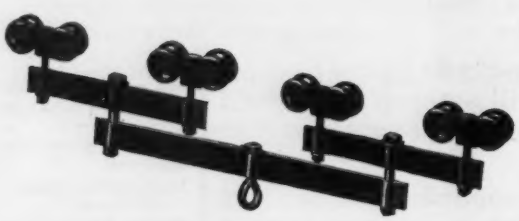
Callahan Sash Operators

For any type of pivoted or hinged wood or steel sash. We have an Engineering Department that will work with you or your architect in the development of plans. Let us give you an estimate.

THE T. J. CALLAHAN CO.

804 S. Perry St. Dayton, Ohio

WAGNER OVERHEAD CONVEYING EQUIPMENT



IS IDEALLY ADAPTABLE TO COTTON MILL OPERATIONS

CONSERVES LABOR---SAVES TIME AND FLOOR SPACE

Do your trucking on the ceiling and consolidate your conveying and hoisting operations.

Wagner Equipment includes a complete line of Switches, Crossovers, Curves, and Cranes. Carriers are equipped with high grade roller bearings and can be furnished with "Hyatt" Roller Bearings if desired.

Write for Catalogue

Wagner Manufacturing Company, Cedar Falls, Iowa.

GEORGE DOWMAN

610-611 WALTON BLDG.,

ATLANTA, GA.

"DOWMAN SERVICE" IS KNOWN ALL OVER THE SOUTH. TAKE ADVANTAGE OF THIS SERVICE WHEN IN NEED OF ANY OF THE FOLLOWING:

FIRE PROOF DOORS
SOLID STEEL SASH
HOLLOW METAL WINDOWS
STEEL CASEMENTS
VENTILATORS
METAL CEILINGS

STEEL BUILDINGS
METAL LATH
STEEL FENCE
SASH OPERATORS
OVERHEAD CARRIERS
ETC.

SEND FOR CATALOGS AND PRICES

Southern Selling Agent for the Products on These

CONTRACTORS AND SALES ENGINEERS

VARIETY FIRE DOORS

61 CROSS-HORIZONTAL FOLDING DOORS
ERECTED ON POSTS 7½ INCHES x 7½ INCHES
AMERICAN RAILWAY EXPRESS COMPANY'S BLDG.
CHICAGO, ILLINOIS

MANUFACTURERS OF A
COMPLETE LINE OF LABELED
FIRE DOORS
ROLLING STEEL DOORS
HOLLOW METAL DOORS
KALAMINE DOORS
SAINO DOORS
VAMANCO COUNTER BALANCED
ELEVATOR DOORS
VARCLAD COUNTER BALANCED
ELEVATOR DOORS
TIN CLAD DOORS
PRESSED STEEL FRAMES
STEEL STOREROOM DOORS

VARIETY FIRE DOOR COMPANY

2958 CARROLL AVE. CHICAGO, ILL.

This Steel Basement Window Removable

A new window sash development. Window stays open without chain or hook, has no hinges. Easily removed from inside. No pins to take out. Locks automatically when closed. Costs no more than wood, admits more daylight. Complete with frame and hardware. Immediate shipment.

BUILDERS! DEALERS! We want live representatives. Write for special prices and agency proposition. THIS IS THE BASEMENT SASH YOU HAVE BEEN LOOKING FOR.

The Bogert & Carlough Co.
Paterson, N. J.

BOCA SOLID STEEL SASH

Low First Cost + Low Upkeep = Low Fixed Charges

A MARYLAND METAL BUILDING

Your best investment

A Maryland Metal Building will give you all the advantages of any type: Strength, Adaptability, Long Life, and in addition, a Fire-Proof Building, A Low Insurance Rate; A "Flexible" Building, its sectional construction permitting alterations without interrupting production, or loss of any material from the old building.

A post card will bring catalogue.

MARYLAND METAL BUILDING COMPANY

Main Office and Plant
McComas & Race Sts. BALTIMORE, MD.

416 Crozer Bldg. PHILADELPHIA
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Distributor Service

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American Hard Wall Plaster Co.

WOONSOCKET, R. I.
Pinault & Choquette

"Save the surface and you save all"

Banish the Shadows!

TO eliminate dingy shadows in textile mills, diffusion and proper direction of light are necessary.

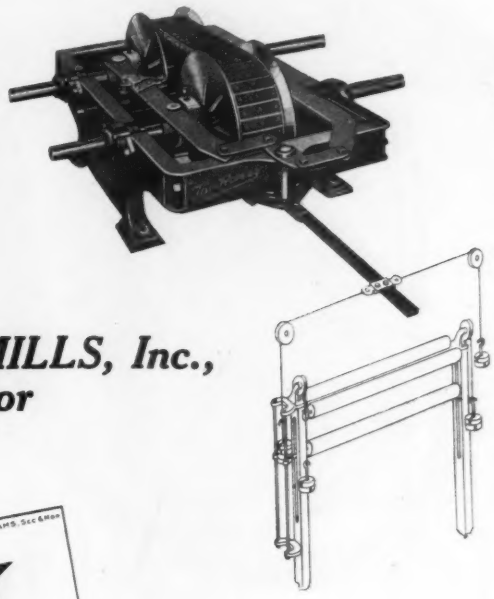
It is for this reason that OJACO Mill White is used by many of the country's largest and most widely known textile manufacturers.

OJACO Mill White is ideal for all textile mill interiors. It reduces glare, makes textile rooms more cheerful and helps the operators to do better work by relieving them from undue eyestrain.

For further details, consult the nearest OJACO distributor or write us direct.

Oliver Johnson & Co., Inc.
Paint Makers since 1833
PROVIDENCE, R.I.

"The Reeves"



MECHANICAL
AUTOMATIC
SPEED CONTROL
enabled
E. M. HOLT PLAID MILLS, Inc.,
to save the labor
of one man.
Read their letter.

E. M. HOLT PLAID MILLS
INCORPORATED
MAKERS OF
FINE GINGHAMS
REDFEATHER
Burlington, N.C.

Feb. 12, 1924.

(Name furnished upon request)

At the request of Mr. Irwin, a representative of the Reeves Pulley Co., it gives us much pleasure to say to you that we have been using The Reeves Variable Transmission, with an Automatic Control, between our Tentering Machine and Scouring Machine, for sometime. In fact, we understand that the first one of these Automatic Controls installed in a Finishing Room was the one put in our mill.

The apparatus is giving entire satisfaction, and we are very much pleased with it. We use a Compensator and a set of Foxwell guides in connection with the Automatic Control, which works almost perfectly without any attention whatever. We have been able to save the labor of one hand since putting in this Automatic Control.

Yours very truly,
E. M. HOLT PLAID MILLS, INC.,
BY Walter H. Williams
SEC'Y & MGR.

WHW/fow.

"The Reeves" Mechanical Automatic Control has made it possible and practical to adopt the range method of finishing cloth as one continuous process in place of the old method of carting the rolls from one machine to another.

Less than three months' wages of the operator referred to in the letter would pay for "The Reeves" Variable Speed Transmission complete with Automatic Control, to say nothing of the increased production, saving of time and material.

Investigate now. Write for Mechanical Automatic Control Bulletin, C-2055.

REEVES PULLEY COMPANY, Columbus, Indiana

Speed

COCHECO BELTING

The industrial atmosphere today is surcharged with that magic word "SPEED"

Competition demands it, machines must produce it, operators must acquire it and profits depend upon it — speed — SPEED — SPEED. In lining up the factors in your plant to meet this demand for more speed in production, "LOOK TO YOUR BELTS" as carefully as to any other part of your equipment.

Cocheco Leather Belting is *built for speed.* It is made from backbone centers of the very best packer steer hide butts, tanned by the long, oak bark method, curried by our own special process and thoroughly and carefully stretched.

Let us tell you how Cocheco Leather Belting has stood the gaff of speed and long endurance for hundreds of big concerns.

Our illustrated catalog is both handsome and instructive—send for it *today.*

I. B. Williams & Sons, Dover, New Hampshire

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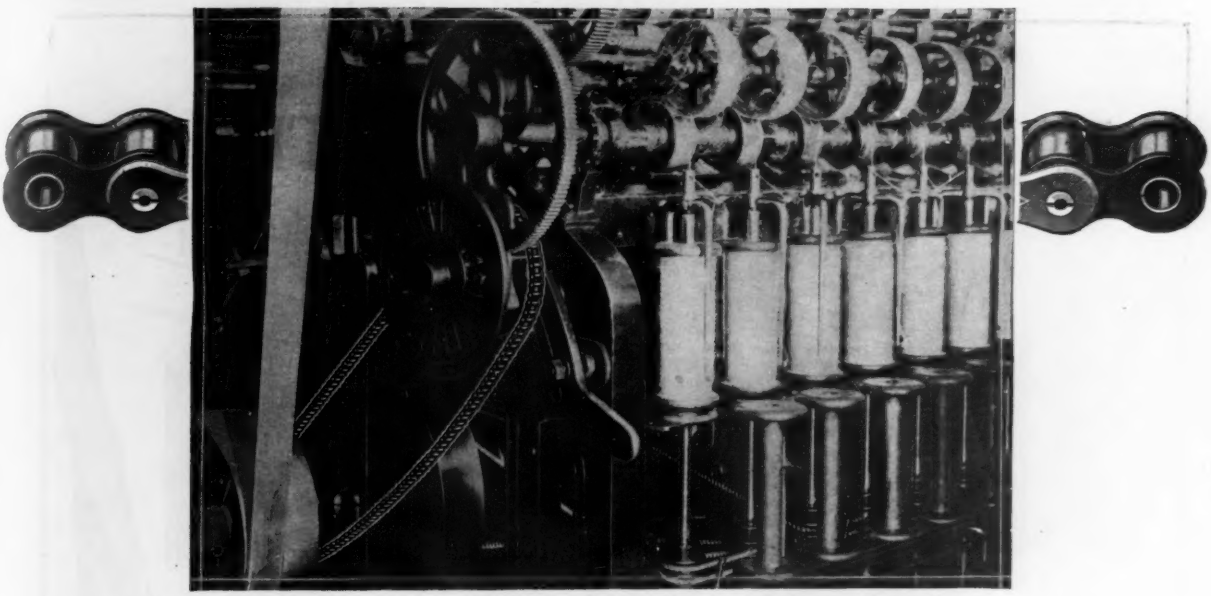
157 Summer St.
Boston, Mass.



DIAMOND Roller Chain used for main drive on Worsted Spinning Frames.

DIAMOND Roller Chain Drives on Worsted Spinning Frames

THESE worsted spinning frames are operated positively and economically by this flexible and reliable DIAMOND chain drive.

DIAMOND roller chains give equally dependable service on looms, cards, washers, dryers, conveyors, dying machines, roving and drawing frames, and many other textile machines requiring efficient transmission of power.

For motor drives, DIAMOND high speed roller chains make the ideal equipment. It has been conclusively demonstrated that these roller chains are well adapted to high speeds and heavy loads and will operate successfully under the most severe conditions.

We have effected notable economies for customers in practically every important industry, by supplying roller chain drives for use between electric motors and machines, from motor to line-shaft, and from line-shaft to machines.

Our engineers are qualified by long experience to recommend the correct drive for your particular purpose. Put your power drive problems up to us before deciding on the type of transmission you will use on your machines and in your mills. You incur no obligation by sending us your specifications, giving the necessary power and speed requirements, so that we can show you exactly how a DIAMOND chain drive will save you money and give better service.

Every mill operator, superintendent and draftsman should have our catalog on file; also our data booklet on chain drives. Mail the coupon for copies. Do it today.

DIAMOND Roller Chains

C. 3-1

Diamond Chain & Mfg. Co.
Indianapolis, Ind., U. S. A.

Gentlemen:

Mail me a copy of your Catalog and your Data Sheets on Roller Chain Drives.

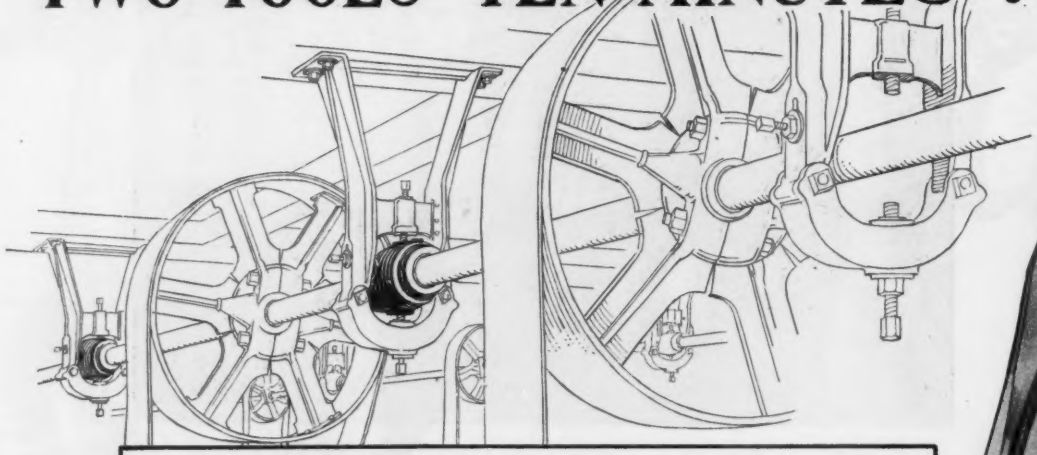
Name_____

Position_____

Firm_____

Address_____

TWO TOOLS-TEN MINUTES !



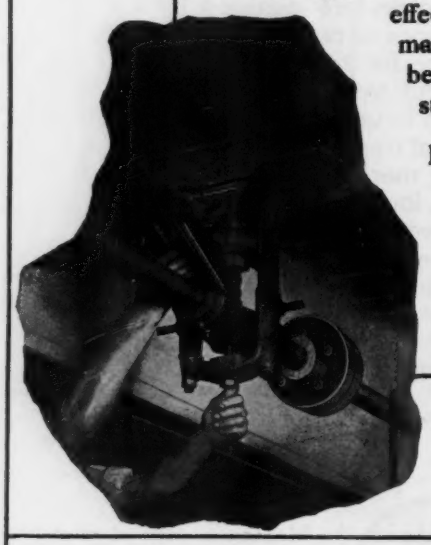
No delay to production!

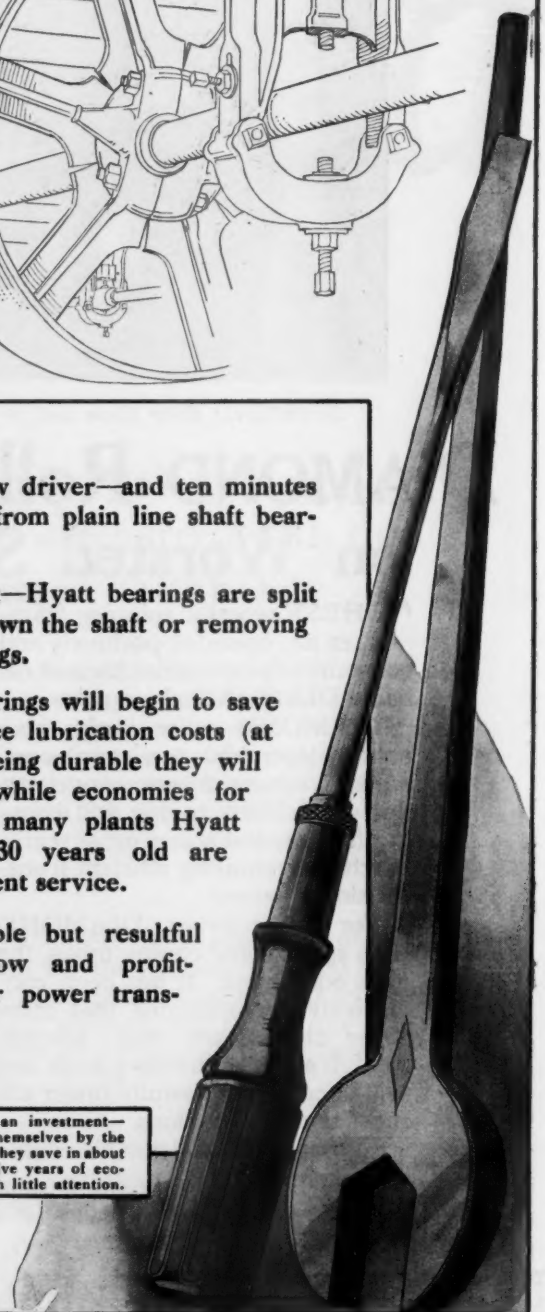
Two tools—a wrench and a screw driver—and ten minutes are all you need to change over from plain line shaft bearings to Hyatt roller bearings.

You need not undress the shaft—Hyatt bearings are split and go right on without taking down the shaft or removing belts, pulleys, collars and couplings.

At once your Hyatt roller bearings will begin to save power (at least 15%) and reduce lubrication costs (at least 80%, oil and labor) and being durable they will effect these worthwhile economies for many years. In many plants Hyatt bearings 20 to 30 years old are still giving excellent service.

Make this simple but resultful changeover now and profitably cut your power transmission costs.





These bearings are an investment—they will pay for themselves by the power, oil and labor they save in about a year. And will give years of economical service with little attention.

'Phone The Nearest Mill Supply Dealer

Hyatt Roller Bearing Company

Newark, N. J.

Pacific Coast Address: Hyatt Roller Bearing Company, San Francisco, Cal.

Double-acting thrust bearing, flat seats (grooved races) 2100-F Series

Single-acting thrust bearing, flat seats (grooved races) 1100-F Series

Single-acting, self-aligning thrust bearing 1100 Series

Single-acting, self-aligning thrust bearing, leveling washer. 1100-U Series

Double-acting, self-aligning thrust bearing, leveling washers 2100-U Series

"How can I increase power without increasing costs?"

The designing engineer of a machine manufactory brought us this problem.

The firm's machines had to be developed to produce more power. They wanted the same machines to give increased production without adding more units.

Our engineers studied the plan of this machine. They found ways to lessen friction at many vital points. They made their suggestions.

With slight changes ball bearings were installed in several places.

Result—Greater speed, greater power, greater efficiency. And no added cost for operation.

These are problems we solve every day for manufacturers. We tell them how to reduce operating costs of their machines. We teach them how to economize power by lessening the amount of power lost in transmission.

If you have problems send them to us. Let our ball bearing experts help you.

There is a Strom Ball Bearing for every application. Every Strom Ball Bearing is machined to the exactness of the finest watch parts. We have large stocks on hand to meet emergency calls.

Strom BALL BEARINGS

Manufactured by

U. S. BALL BEARING MFG. CO.

4544 Palmer Street

CHICAGO, U. S. A.

Single-row deep-groove Standard type, radial bearing

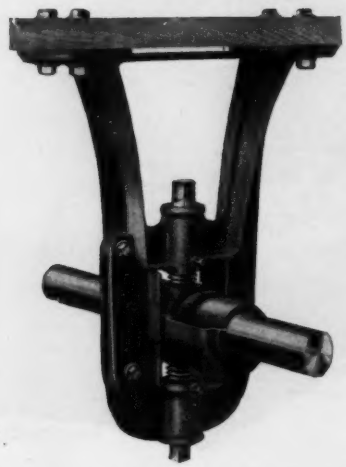
Double-row, deep-groove Standard type, radial bearing

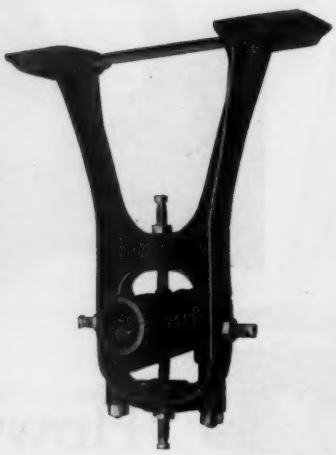
Angular contact bearing, combination radial and thrust

Double-row, maximum type, radial bearing

Single-row, maximum type, radial bearing

DODGE

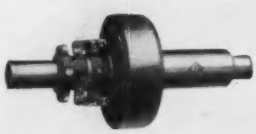




DODGE Means Power Savings

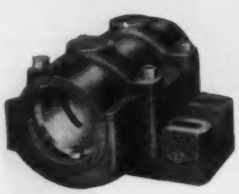
Your power roadbed is an important factor in determining your power costs. Dodge transmitting machinery insures balanced power; balanced power means less friction; less friction means lower costs and increased profits.

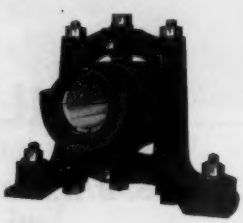
Dodge makes everything for the mechanical transmitting of power. Stock units can be purchased from your local dealer on the immediate delivery basis.



Dodge Manufacturing Corporation

General Office: Mishawaka, Indiana. Works: Mishawaka, Indiana, and Oneida, N. Y.
New York Philadelphia Pittsburgh Boston Cincinnati Newark Chicago
Atlanta Minneapolis St. Louis Houston Seattle San Francisco





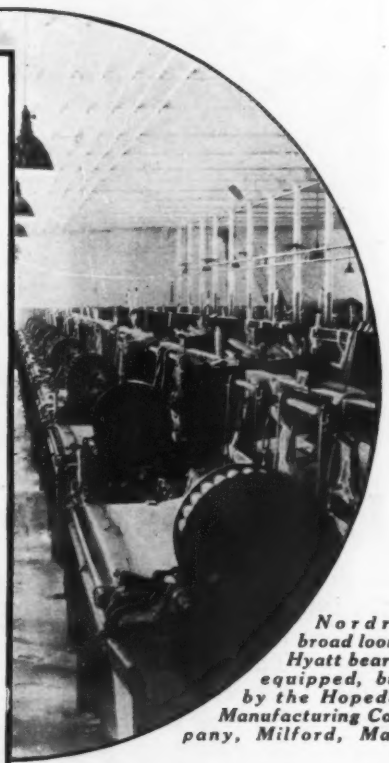
Install Hyatt Equipped Looms For Better Production and For More Economical Operation

One hundred and one new Nordray broad looms built by the Hopedale Manufacturing Company, Milford, Mass., and equipped with Hyatt roller bearings are now in operation at one of the prominent North Carolina mills.

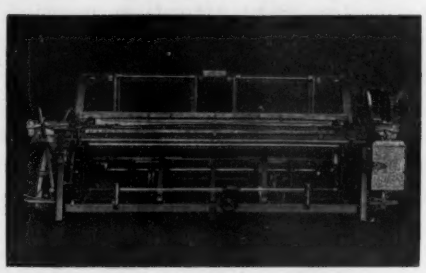
By specifying that these new looms be Hyatt equipped this mill has insured dependable and economical weaving for years with no necessity of bearing adjustments or replacements.

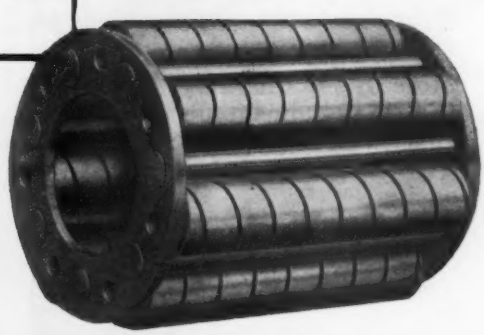
The new looms in this southern mill are similar to the Hyatt bearing Nordray broad looms recently installed by the Pepperell Manufacturing Company of Biddeford, Me. These mills can look forward to superior weaving and to worthwhile savings in power, in lubrication and in maintenance costs.

Secure these weaving advantages for your mills —specify that your looms be Hyatt equipped.



Nordray broad looms, Hyatt bearing equipped, built by the Hopedale Manufacturing Company, Milford, Mass.





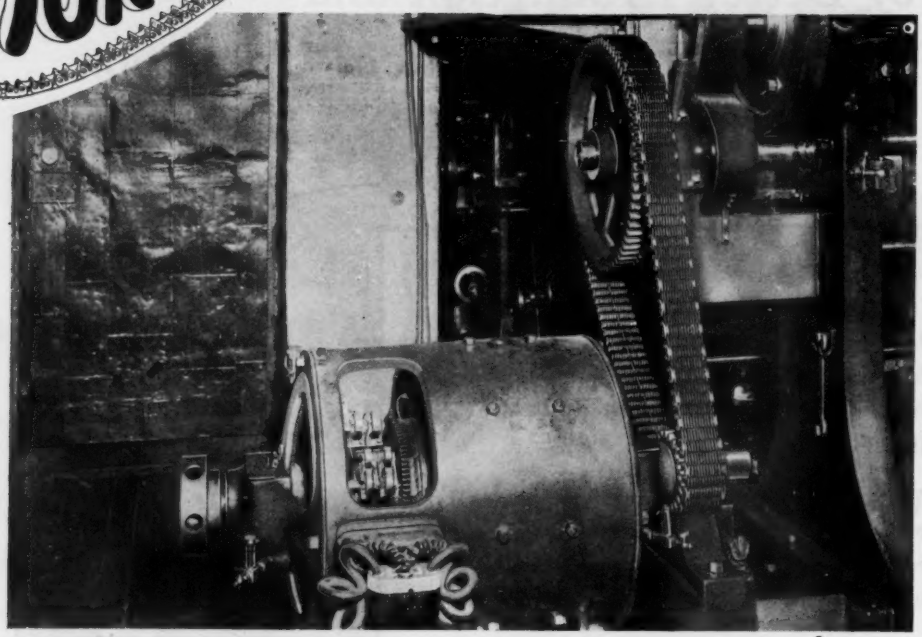
HYATT ROLLER BEARING COMPANY

Newark Detroit Chicago San Francisco

Worcester Milwaukee Huntington Minneapolis Philadelphia

Cleveland Pittsburgh Buffalo Indianapolis

MORSE SILENT CHAIN DRIVES



Low cost power transmission

In determining the cost of the drive, the initial cost that appears on the invoice is not the only item of expense. The actual cost will in due time be reflected in the payroll, and general expense sheet. In considering all the factors that make up cost, you will find Morse Silent Chain Drives actually cost less than any other form of drive.

Morse Silent Chain Drives transmit 98.6% sustained efficiency. This remarkable performance, means greater power, substantial power saving.

Morse Silent Chain Drives operate with maximum efficiency over short centers. This makes a very definite saving of valuable space possible.

Maintenance and up-keep are additional factors that enter into transmission costs. Morse Silent Chain cannot stretch, does not require treatment or constant dressing. In many instances the chain never has to be repaired in any way, shape, or form, the only attention required is timely lubrication.

Economy is the deciding factor, economy in saving power, space, maintenance, and up-keep costs, inventory and time.

MORSE CHAIN CO., ITHACA, N. Y.

There is a Morse Engineer near you

ATLANTA, GA....702 Candler Bldg., Earl F. Scott & Co.
BALTIMORE, MD.....1402 Lexington Bldg.
BOSTON, MASS..... ...141 Milk Street
CHARLOTTE, N. C.....404 Commercial Bank Bldg.
CHICAGO, ILL.....Room 802, 112 West Adams St.
CLEVELAND, OHIO.....421 Engineers Bldg.
DENVER, COLO.....1761 Wazee St., R. M. Parsons
DETROIT, MICH.....7601 Central Avenue
KANSAS CITY, MO.....Finance Bldg., Morse Eng. Co.
NEW YORK CITY.....Room 1871, 50 Church St.
MINNEAPOLIS, MINN. 413 Third Street, S., Strong-Scott Mfg. Co.
MONTREAL, QUE., CAN. St. Nicholas Bldg., Jones & Glassco, Reg'd
PHILADELPHIA, PA.....812 Franklin Trust Bldg.
PITTSBURGH, PA.....Westinghouse Bldg.
SAN FRANCISCO, CAL.....Monadnock Bldg.
ST. LOUIS, MO.....Chemical Bldg., Morse Eng. Co.
TORONTO, ONT., CAN. Bank of Hamilton Bldg., Jones & Glassco, Reg'd
WINNIPEG, MAN., CAN. Dufferin Street, Strong-Scott Mfg. Co.

2048-30

FOXWELL GUIDERS

Unerring Automatic Fingers take the place of hand labor

Fabric traveling through finishing machinery tends towards a serpentine motion, right to left. The second that the cloth is out of line it touches a sensitive upright finger at either side of the Foxwell Guider. Instantly a valve is opened. A pair of cylinders on either side revolve, nipping the material between them and again centering it absolutely in the machine.

We'll send our book on Foxwell Guiders. They are shown on various types of machines.

We are the sole makers of Foxwell Guiders in the United States

H. W. Butterworth & Sons Co.
Established 1820
PHILADELPHIA, PA.

Providence Office: Turk's Head Building

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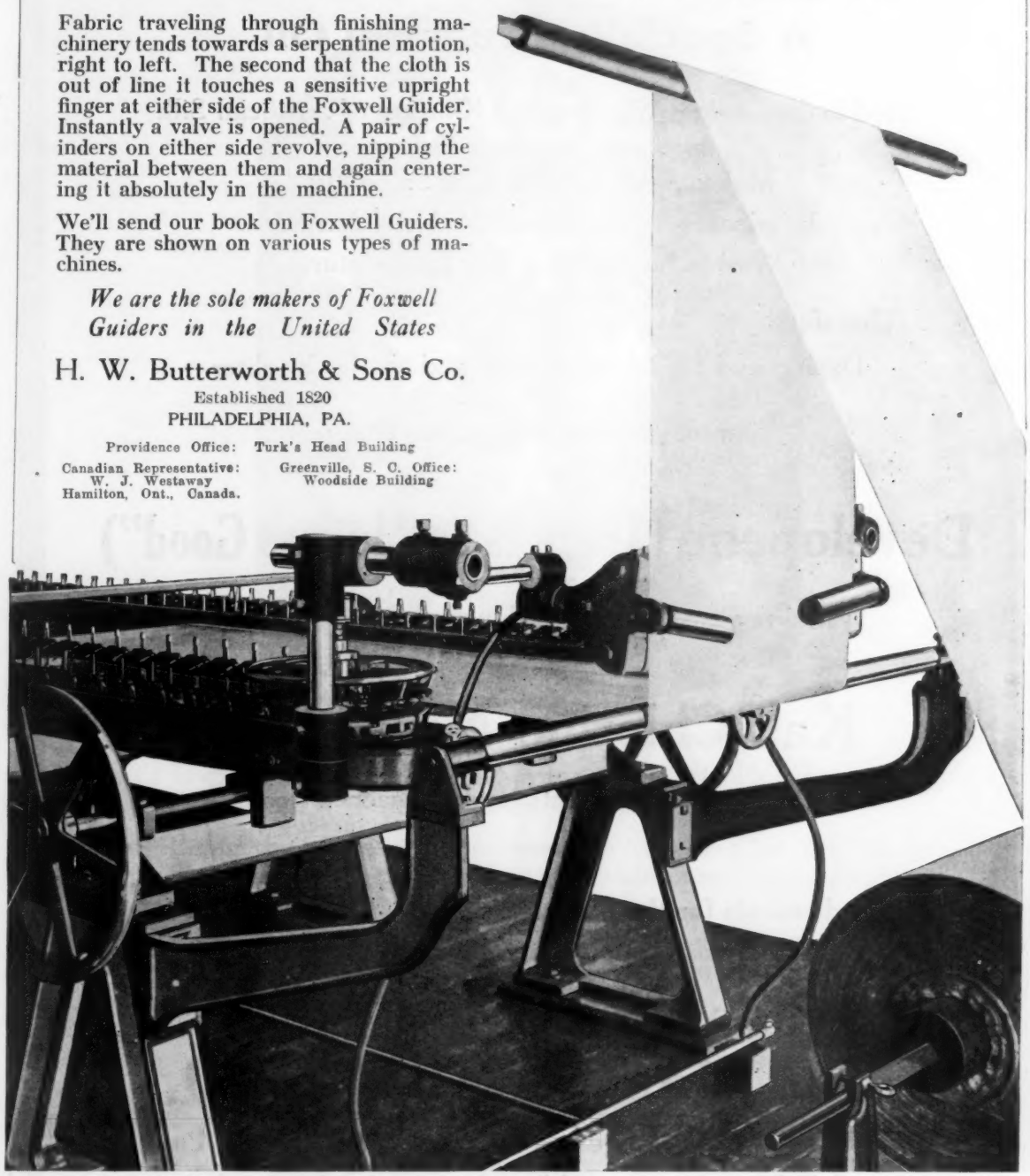

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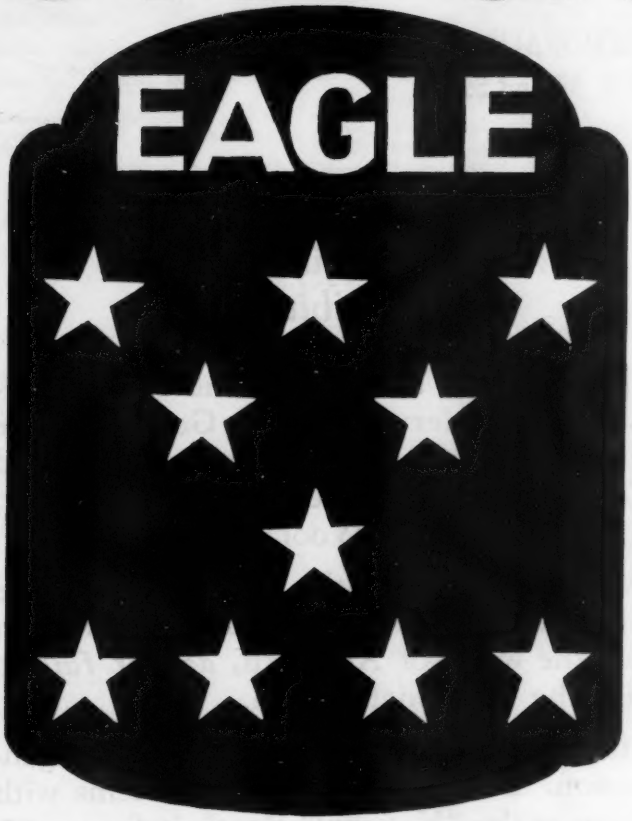

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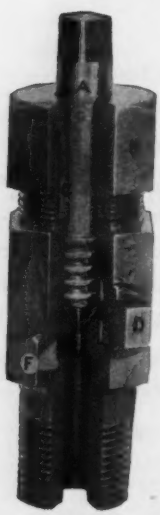
MATHIESON Chemicals



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With the Publishers

What the Readers Think

We are reproducing here extracts from just a few of the many letters received congratulating us on COTTON'S Twenty-fifth Anniversary Number:

"I have found the contents intensely interesting and like very much the way the facts have been presented. In many ways the work has been done in an original fashion and for that reason this anniversary number makes one wish to study it more closely than some publications which attempt to present everything in the shape of figures or statistics rather than by diagrams such as you have used. I have no doubt that everyone who has had opportunity to examine this number carefully will agree with me that it is quite the best thing which has been published in its line as relating to southern cotton mill development."—L. W. Clark, general manager, The Carolina Cotton & Woolen Mills, Co., Spray, N. C.

"I want to congratulate you particularly on your success in getting together data of the gradual improvement in the industry during the past twenty-five years."—Bernard M. Cone, president, Proximity Manufacturing Co., Greensboro, N. C., and president of the Cotton Manufacturers' Association of North Carolina.

"I wish to congratulate you in your effort, for I must say it is the most comprehensive publication of this nature that I have ever seen."—Jno. B. Humbert, manager, Seneca Company, Seneca, S. C.

"This is one of the handsomest and most valuable editions of any textile journal that it has ever been our pleasure to receive."—Brown Mahon, vice-president, Judson Mills, Greenville, S. C.

"It is very attractively gotten up and the reading matter is not only well arranged but very interesting."—Emslie Nicholson, treasurer, Monarch Mills, Union, S. C.

"We think it is fine—indeed it is better than anything gotten out by any textile paper, in our opinion."—P. E. Glenn, secretary and treasurer, Exposition Cotton Mills, Atlanta, Ga., and president of the Cotton Manufacturers' Association of Georgia.

"I enjoy its contents more than any other publication which comes to my desk."—R. P. Clark superintendent, Standard-Coosa-Thatcher Co., Chattanooga, Tenn.

"We wish to compliment you on your edition, and have read through it with a great deal of interest and pleasure."—Donald Comer, vice-president, Avondale Mills, Birmingham, Ala.

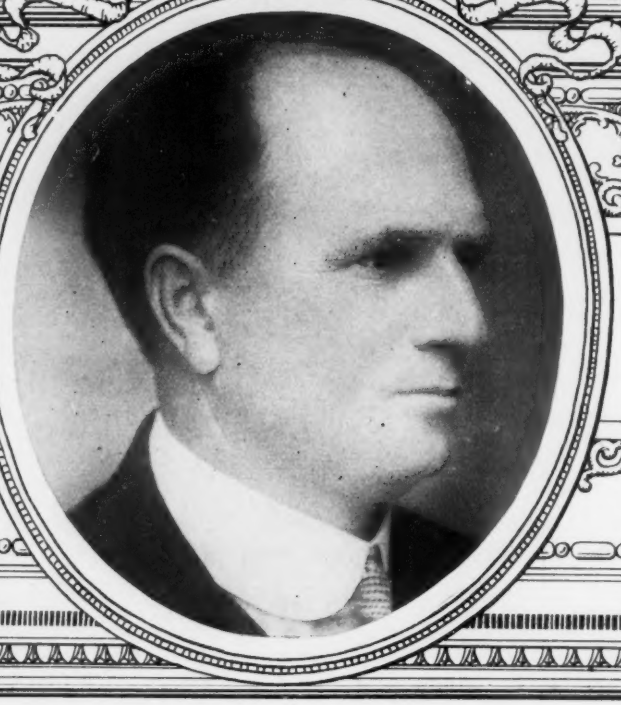
"I do not hesitate to say that there is no publication that comes to my desk that I read with more interest than yours."—J. H. Ledyard, president and general manager, Tupelo Cotton Mills, Tupelo, Miss.

"I received the copy of your 25th anniversary number and wish to congratulate you upon the very superior edition. It is always a pleasure for me to read your magazine."—R. A. Morgan, agent, Maginnis Cotton Mills, New Orleans, La.

"It is certainly a splendid presentation of the progress made in the textile industry during the last 25 years. However, I think you deserve more credit for the high quality of your magazine from month to month, as every issue, it seems to me, gets more interesting each month.

"COTTON has so far out-stripped its competitors that it has long since ceased to be a debatable matter as to what is the best textile journal printed in the United States."—C. S. Tatum, manager, Boham Division, Consolidated Textile Corporation, Bonham, Texas.

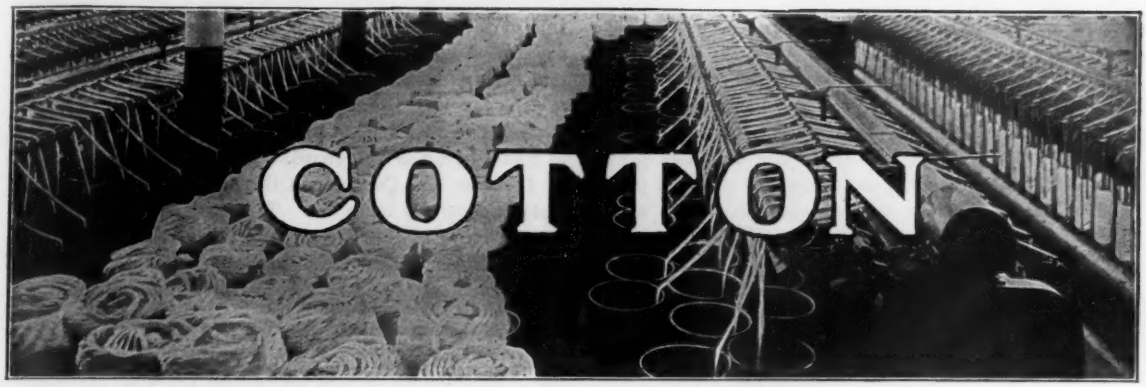
AMONG COTTON'S READERS



J. S. Bachman, Superintendent,
Anchor Duck Mills,
Rome, Georgia.

"I have been a subscriber to COTTON since its first issue and consider it among the best trade papers published."

J. S. Bachman



March, Nineteen-Twenty-Four

Corruption in High Places.

For the first time in half a century, what appears to be corruption in its coarsest and crudest forms has been traced to high quarters in the Government at Washington. Shameful facts as to the conduct of a bureau which spends nearly a half billion dollars a year for peculiarly benevolent purposes were first disclosed. Then came the scandals concerning a cabinet officer who appears to have been guilty of indiscretions that bear the ear marks of the crudest forms of official venility.

That the country was shocked by these disclosures is not surprising. While a measure of petty corruption of the crude kind adheres usually to all government, high officials in the Federal establishment have been, as a rule, singularly free from even suspicion on the score of that kind of dishonesty commonly comprehended by the word graft. Many cabinet officers and bureau chiefs no doubt have been guilty of wrong doing but surprisingly few of them have been so much as accused of mal-feasances of the low and clearly criminal kind, such as, for example, the acceptance of money bribes.

In despite of recent scandals, it no doubt is a fact that insofar as goes that form of probity which might be termed money honesty those who conduct the affairs of the Federal Government rate unusually high. Nearly all students of the subject are of the opinion that in this respect the realm of government is cleaner than almost any other.

Popular belief, however, is largely to the contrary. This is due in part to the fact that we still judge public officials largely by traditions coming down from past periods when money honesty was less prevalent among them. It is due in greater part probably to the fact that we properly would hold public officials to higher accounting in this respect than persons in other realms of activity are held.

Thus disclosures of the kind which recently have shocked the country are apt to give over accentuation to the suspicion entertained by many if not most persons concerning public officials. And in further weakening the public's never strong confidence in their money honesty, this may tend to subvert attention to other kinds of honesty or the lack thereof.

Any good psychologist will tell you there are a hundred or more different kinds of honesty and dishonesty. None of us is so angelic or vile as to possess all of either kind, and each of us no doubt possesses some of each kind.

While, as stated, money honesty is more prevalent in governmental than in most other circles, other and quite important kinds of honesty are less common in governmental circles.

We get very much excited when it is found that a few out of thousands of officials have stooped to the taking of money bribes. But we rarely get excited when a much larger number takes bribes in more subtle and less apparent forms. And we are indifferent to that most pernicious of corruption which lies in the wasting of public funds and the passing of unfair and injudicious laws for the mere purpose of getting votes—that is, to keep the persons who waste the funds or pass or enforce such laws in their public jobs.

For every dollar stolen in the form of outright graft or gained through the acceptance of direct money bribes millions of the people's money are thrown to the winds by officials who, as a rule, are entirely free from the coarse, crude and patently criminal forms of corruption.

No one can condone money dishonesty in official realms but it is well not to let excitement concerning an occasional exhibition of it obscure all thought of other and really more prevalent forms of official dishonesty.

Recent disclosures of apparent corruption in high official circles at Washington may serve a good turn in giving dramatic illustration of the dangers which adhere to the vast expansion of governmental activities which has been going on in recent years. An examination of the records of the Congressional investigation of the U. S. Shipping Board and its Emergency Fleet Corporation, particularly those activities during 1919 and 1920, will furnish another example if one is needed.

These big trusts and responsibilities which the Government takes over must be administered by human beings, subject to all the weaknesses of the race. The bigger and more far reaching these extensions be, the less easy it is to keep accurate check on the human factor involved. The danger of graft, while real, is infinitesimal compared to other dangers which go with this tendency, such as the abuse of power, the breaking down of popular control of public affairs, and the development of tyrannical bureaucracy and autocracy.

The government is not in itself a living creature; it is only what those in charge of it make it. Few if any

persons are perfectly capable of governing others. Thus government is much of a makeshift which grows probably more out of the evil than out of the good that is in us. It can be misused in various ways and the more remote it is from contact with the governed the easier it is for such to be done. Thus its powers and activities should be kept at the lowest minimum compatible with the public good. This is the best way to curb dishonesty of all kinds in its administration.

The Ways of Tax Reduction.

Often in recent times observers of public affairs, especially those having to do with the Federal Government, have been disheartened by apparent public indifference as to gigantic transactions of great import. Frequently during the last ten years Congress has appropriated tens of millions of dollars for new governmental ventures without the body of the people seeming to care a straw whether these ventures were meritorious. Indifference as to taxes levied for these expenditures has been almost as great. In truth, the Government's complex and dubious system of levying taxes seemed to be acting as a deadening drug on the public conscience and intelligence. Deluded by the appearance of large parts of the taxes coming from wealthy individuals and rich communities, the public seemed inclined towards the opinion that the more the Federal Government raised and spent the better it would be for the majority of people and communities.

But public reaction to the proposal that Federal taxes be reduced consequentially, and that in reducing them the taxing system be in a measure reformed, has been of a nature which tends to offset the foregoing melancholy picture. That public opinion in this country still can function soundly and no doubt effectively is indicated by this reaction. Not in many years has the public raised its voice so assertively on a public question as it has done with reference to the proposed reduction in Federal taxes.

The issue involved in the matter is very plain and simple despite the befuddlement with which many members of Congress and other persons have tried to cloud it.

For more than a year now the Federal Government has been taking from the public in the form of taxes more than $300,000,000 above what it needs even on the basis of an all too extravagant policy of expenditure. If this money had been taken calculatedly, it would be a case of extortion. It was the product of improved business conditions which could not be anticipated when present tax laws were framed. If a business concern through error collects from you on a bill more than is due it, common honesty requires that a refund of the excess be made. The concern would have no right on its own motion to spend this excess even for your benefit.

The same rule of common honesty applies to the Government in the present situation. This surplus which is being accumulated by mistake as it were, belongs not to the Government for expenditure on new projects but to those from whom it was taken. Therefore, it should be returned in the only practicable way available, which is in the form of reductions in present taxes. If new projects are to be undertaken let Congress levy new taxes to meet the expense and then the public can pass on the merit of these ventures in terms of direct and apparent cost to it. One of the best rules that, if feasible, could apply to the making of public appropriations would be one requiring that each authorization of an expenditure carry with it a specific tax levy for securing the needed funds. If that were done a vast amount of public spending now engaged in would never be authorized.

It seems that Congress in this instance will make due restoration to the taxpayers. This owes chiefly to the demand aroused by the "Mellon plan" in which the issue was put forth very clearly and succintly. For Congress no doubt would rather spend these surplus funds on political "pork."

Some officials would rather have no tax reduction than for it to come about in the way proposed by the Secretary of the Treasury, and others, it would seem, would rather have none than to get it in any other way. Dispute over the method offers the only danger to the tax reduction program.

The method is of importance but it is not of first hand import. High surtaxes on incomes should be reduced radically, for the purpose of experiment if for no other reason. If they tend to drive much capital out of private enterprise and thus cause an undue stiffening of interest rates and result in additions to the general cost of living far beyond what these surtaxes yield to the Government, a few years' experimenting with low surtaxes will demonstrate this fact. We know that with high surtaxes interest rates have gone up, that mortgage money costs perceptibly more, that industrial securities have to pay from one to two per cent above what they could be floated for before the income tax was adopted. Whether the high surtaxes is the chief cause of this can be determined only by experiment. If the test proves that they are not the cause then they easily can be restored.

Most of the protest against "lifting the tax burden from the rich" is political buncombe. Even if the taxes paid by the very wealthy actually come from what the wealthy otherwise would enjoy and are not passed on to others, as many believe, the sum total constitutes only a small percentage of all the funds raised by the Federal Government. To insist that in order to get this small percentage the Government shall be permitted to raise more than it needs or to waste as much as it can get is to contend for the ridiculous. It is worse than ridiculous; it tends to "Chinafy" public opinion as to the Government. If the time comes when the majority of people think that the business of government is to exploit minorities on behalf of the majority, then our government will be on the road to the nauseous state of the Government of China.

There is merit in the suggestion that the number of income taxpayers be reduced even more than proposed in the Mellon plan. From more than a million returns now made not enough is collected to meet the expense of handling them. This is senseless waste. Those who pay income taxes should be required to pay enough to make them fully conscious of the fact that they are supporting the Government. After that, the greater the number that is required to pay the better it will be for all concerned. For those who are made conscious of paying will be inclined to give attention to the spending, which is the important equation. For the spending of public funds can involve much more than excessive taxation or mere waste of money.

It is doubtful if the Mellon plan of tax reduction and reform goes through in all particulars. But its essence, which is material reduction in the amount of money the Federal Government is taking from the public, will be adopted—or a good many public men soon will become mere private citizens.

Some Factors to Be Considered in Styling Cotton Prints

BY HIBBARD S. BUSBY.

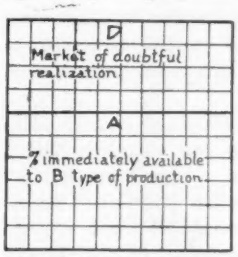
It is natural that scientific analysis of the problem of making cotton mills pay should eventually arrive at the importance of styling, and its influence upon the economic status of the business. Indeed, this factor has always been well evaluated among the men who made the business, but has been passed over somewhat in face of the enthusiasm to follow any panacea with which so much business has been afflicted since the beginning of post-war re-adjustment. It remained for an unquestioned authority to focus attention on the seriousness of this matter and to urge study of it to the degree it deserves.

The chief factor, at the outset of this problem, is based upon appreciation of the interdependency of the mills and the merchandising (in this sense, the sales) departments of the business, upon each other. Without clear recognition of this situation no thoroughly effective plan of styling can be hoped for.

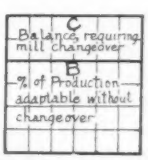
A market is frequently encountered that is right in terms of prices, deliveries, credits and all the other matters of satisfactory business relations except that to supply it means the serious consideration of whether the mill is adapted to produce for it without certain vital realignments of method which involve serious expenditure and delay. There is always this matter of the physical and chemical (process) limitations of the mill, no matter how modern and up-to-the-minute in flexibility of production it may be otherwise. It is not possible to construct a mill property, in this or any other year, and to so equip it that the vagaries of a transient and extreme style can be turned out therefrom without some alterations. Even were the *equipment* suitable there is the ever-present problem of utility characteristics of the finished cloth, such as various types of fastness, etc., and the further circumscribing limits of available dyestuffs having the desired properties and otherwise suitable to produce the exact shades desired. A great many yards of goods have been turned out, in the past, printed with slightly and even considerably different shades and color combinations from those desired when the designs were approved. Sometimes these sell, again many yards move slowly—in any event, there is much evidence in favor of the belief that, with allowance for all possible doubts in the matter, the goods would have moved faster had they been printed in the exact colors designed. Nor does an unusual effort on the part of the sales organization to move them mollify this condition in the slightest degree; extra sales effort *always* costs additional sales expense for the same value of goods. The correction must come in the production, or rather, in the partial modification of style-demand to making only reasonable demands of it.

On the other hand, the stylist knows that he cannot modify his demands beyond certain limits, or selling to that market is out of the question. Therefore he must know the mill, its facilities and its limits. He must also know the limit possibilities of process details, and in order to be really effective should keep informed on the very latest evolutions of the applied science of the most up to date manufacturing processes, particularly from the point of view of how practical and how efficiently each may be expected to be on a production basis. The creative department should produce *only* upon the basis of reconcilement of these facts and style demand. And, unquestionably, the mill itself should be most efficient along this line of up-to-dateness, it is its very life and status.

In other words, the problem can be analyzed in the manner shown by the accompanying figure. Although the basic principle of this is pretty well recognized it frequently happens that failure to set down, clearly, all the contributing factors results in failure to include one or more with consequent failure to have provided for certain eventualities of circumstance and the danger of futile efforts in planning the program.



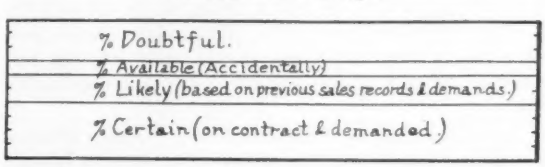
Total Style Market



Total Production of one Mill

Problem:
To sell

1. Distribution of as much of B into A, (A-B) as possible.
2. To see, first if (A-B) = or is more than C, if so: P_1 : cost and time of conversion of C to B type; P_2 : cost and time of conversion of C to D type.



Analysis of Production Demand on one Style

The most important matters to have in consideration in making the analysis diagrammed are those of time, and degree of sales effort. Not only does time mean sales or the loss of them, but its cost, spread over production, is usually the costliest item chargeable against a bulk sales program. It must be remembered, here, that time, in the above-mentioned sense, is the total time spent by the styling and sales force plus the time required for mill changeover —a very heavy bill in executive-time and a factor which

runs up cost at many times the rate of production time, even with all its attendant expenses of overhead, etc. Therefore, it is easy to see that a program may be considered more favorably which looks to increased labor per yardage production than one which looks to even a moderate amount of changeover time.

It comes down to this: The ingenuity of the individual capable of applying the *process-resources* to new demands in range of color and finish is probably the most valuable single element in this planning of the program, because speed and facility mean so much saving of expense at this point. Not only is this important from a cost point of view, but with such an asset to be relied upon, the minimum number of personnel are affected, resulting in that the throes of changeover (in the organization) are less felt as a disturbance to orderly routine. The ability to convert styling specification, with dispatch and smoothness, to production fact has more than once been the thing which made and maintained a business.

The second factor of importance in styling is the relative position an individual mill (or chain of mills) bears to all other mills in the field which are candidates to supply the potential market.

Leaving out the matter of conceding that some organizations are clever enough to ride the crest of commercial relations without association with others in their field, it must be apparent that in this matter, at least, all manufacturers would benefit from centrally-assembled statistics of mill adaptability and style adaptation facility. There is not a single company in the cotton field that could afford to do this work thoroughly in such manner as to make it profitable, any more than they could get the entree to the information they sought.

Centralization of such data would be a tremendous economy step for one vital reason over all others, that it would provide the background of a very large and important function, that of placing the dependency for allotting styled quota to be manufactured upon absolute facts rather than upon the "experience" of the commission-house stylist. This basis is, obviously, a vital factor in the entire styling problem, as explained above, and once secured, coordination may be worked out with commission houses. It would be of immense benefit if the commission houses themselves worked out a similar centralization of their share of the problem; it is always easier and quicker for two central bodies to arrive at an efficiently working plan than for half a thousand, divided into two groups, to function successfully. The problem would, then, more clearly than at present, resolve itself into the true functions of each group, manufacturing and merchandising.

Such centralization of the bases for forming effective and helpful conclusions as outlined above are very properly functions of the manufacturers' association. With the experience and standing of this association to start from it is, in no sense, an insurmountable obstacle to get at the salient facts with the membership. Very shortly this cooperation would be an additional reason for participation in the membership and realization of the very happy condition of there being no outsiders in the trade.

Perhaps the greatest single benefit to acrue to the individual manufacturer from such co-ordinated effort is the economy in direction of effort that such solidarity of action provides and the protection it offers against blowing of costly "bubbles" in an endeavor to encompass new markets.

The procedure that is suggested as being most effective to bring about the required coordination with least delay is to form a style-representative committee made up of members from each section of production. These men, equipped by their status and location, could supplement and interpret in very short order the data furnished by the surveys suggested.

Considerable attention should be devoted, by this committee and the persons in the association, with whom rested the responsibility for ultimate decision as to individual mill capacities, to the various leeway factors to be taken into account in rating status, such as special process ability in mill staffs, skill in creative ability, etc.

The third and most vital basis for proper styling is the science itself. Without the aforementioned backgrounds no proper basis is created for effective functioning of the thing itself, but the profession of styling is one which is so specialized and so dependent upon a wide experience and training as to be well worthy of rating along with any other for which letters in diploma are granted by any university. In importance to the happiness and the degree to which its activities engage the attentions of numbers of citizens I think I am correct in saying it far outnumbers, in importance, any one, if not all of these.

The technique of this matter of style is defined for us as the ensemble produced by the creation of effects of beauty in form, line and color. In the many ramifications of design, all striving to achieve that end, emphasis is placed usually upon one or another of the elements in the definition. It is a wise designer and a wiser stylist who insists upon the major effort being concentrated upon that element or elements which is most distinctly part and parcel of the material and its uses for which the design is created.

For instance, some of the largest volumes of low priced prints are advertised, featured and sold almost entirely upon the basis of their color-competitive value. Here price is of secondary importance, the differential is so small. It would seem almost as if the majority of cotton prints adhered somewhat preponderately to "line" rather than to color, especially if we judge from the fact that so many types of stripes, plaids, checks, etc., sell year after year. Closer examination, however, and check-up on the demand for these lines reveals that "line" has an axiomatic function here—much as we always expect marbles to be round—but that, like marbles, these standard prints sell on their color appeal.

Some of these colors have reached the undisputed position of regulars; they have withstood all competitive attempts to dislodge them. It is not difficult to see why, when they are compared with the competitors. On the other hand there are others, supposedly regulars, and still others which have no sure status, as yet, that are very certainly at the mercy of a stylist who will substitute for them the exact color treatment adapted to them. This is not a high mystery, but resolves itself into very simple elements, with proper application to the problem. I am reasonably convinced that there are manufacturers (of some of these lines) who could not be persuaded to see either the logic of this contention or to make a change from their existing color schemes. As always this is the

(*Continued on page* 523.)

Determining Yarn Costs

BY S. R. GORDON.

STEPHEN GORDON AND STAFF.

Labor, Production and Payroll.

In the preceding section, we have explained how the flow of material into the mill is regulated and the records secured thereon. We will consider under this heading the methods for obtaining the production and payroll records.

The pounds of cotton, picked, mixed and lapped, are obtained from the Material Summary, Fig. 8. If both carded and combed yarn is made, the cotton consumed must be summarized, as shown on this form.

The cotton noils produced in the combing department must be bagged, weighed and ticketed, using a ticket similar to Fig. 3 with the word "Noils" printed upon it. When the noils are bagged and ticketed, the looser half of the tickets are returned to the office where they are posted to a contract record sheet, headed: "Cotton Noils."

The cotton noils may be sold or they may be used again in the manufacture of the coarser numbers of carded yarns. If they are used in this way the bag tickets are treated in the same manner as the bale tickets. The noils priced at their market value are added to the cotton consumed for carded yarns and deducted from the cotton consumed for combed yarns, as shown on the Material Summary, Fig. 8.

The next record of production is the yarn as it is

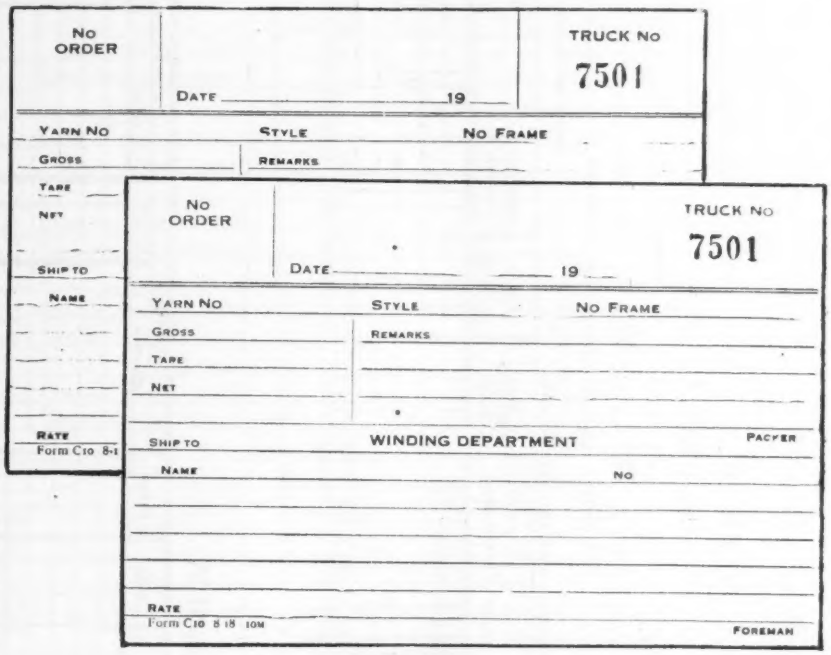


Fig. 9. The Truck Ticket.

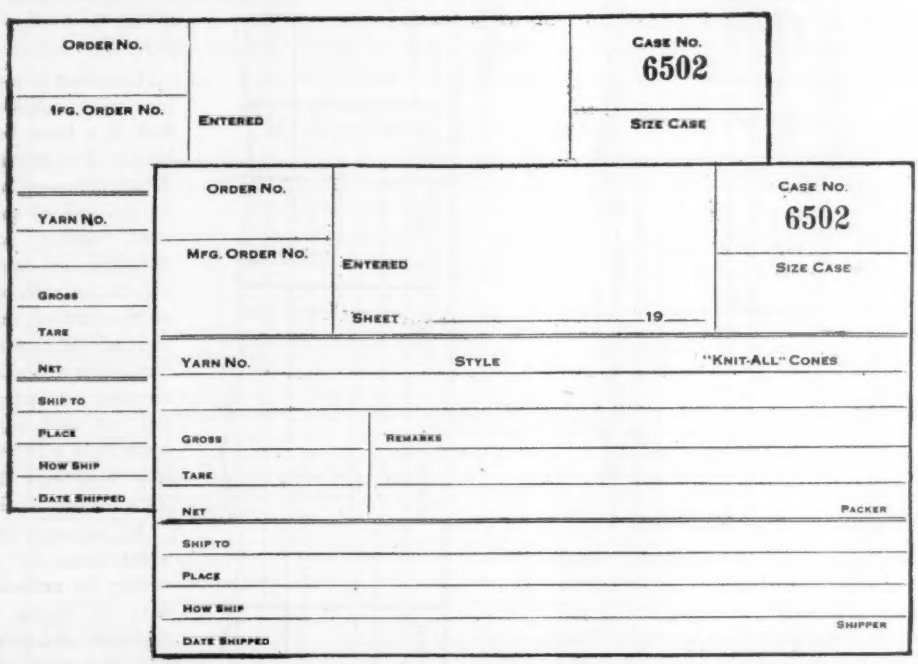


Fig. 10. The Yarn Case Ticket.

taken from the spinning frames. Each doff may be weighed, or the doffs of the same number and kind may be assembled in a large truck before weighing. Truck Ticket, Fig. 9, is used for this purpose, one ticket for each doff or truck. The truck ticket is made up in an original and a duplicate. The duplicate is cardboard and goes with the yarn to the winding department. The original is paper and is forwarded to the office as a record of the weight of yarn spun. These tickets are serially numbered and should be checked to be sure that none of them are lost. They may be filed in a small box file and recapitulated at the end of each week or month, giving the total pounds of each kind and number of yarn spun. If the yarn is conditioned on the bobbins before winding, the weights should be taken before conditioning.

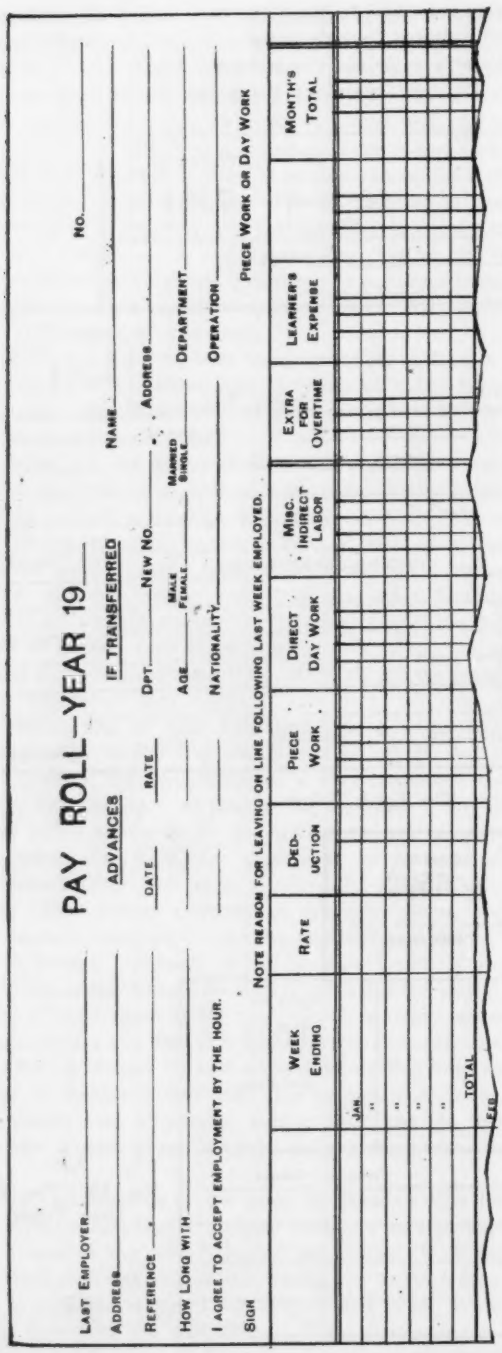


Fig. 11. Pay Roll Sheet.

The yarn is then doubled, wound, etc., and packed for shipment. The finished weight of the yarn should be taken as it is packed, using for this purpose Yarn Case Ticket, Fig. 10. This form is made in duplicate. The duplicate on cardboard remaining with the yarn until final disposition. The original is forwarded to the office, filed, etc., and serves as a final production record of the mill.

The Pay Roll, Fig. 11, offers a very satisfactory method of recording the weekly pay roll. It combines three records, pedigree, total amount paid yearly to the individual operators for government tax purposes, and the pay roll.

One sheet is used for each employee filed in a loose leaf binder by department and operation. At the end of each week, adding machine lists are taken off, taking subtotals at the end of each division of operations, thus affording an easy method of pay roll analysis in accordance with Pay Roll Summary, Fig. 12.

We have now provided means for securing the necessary data in regard to materials and labor. We have yet to consider the puzzling

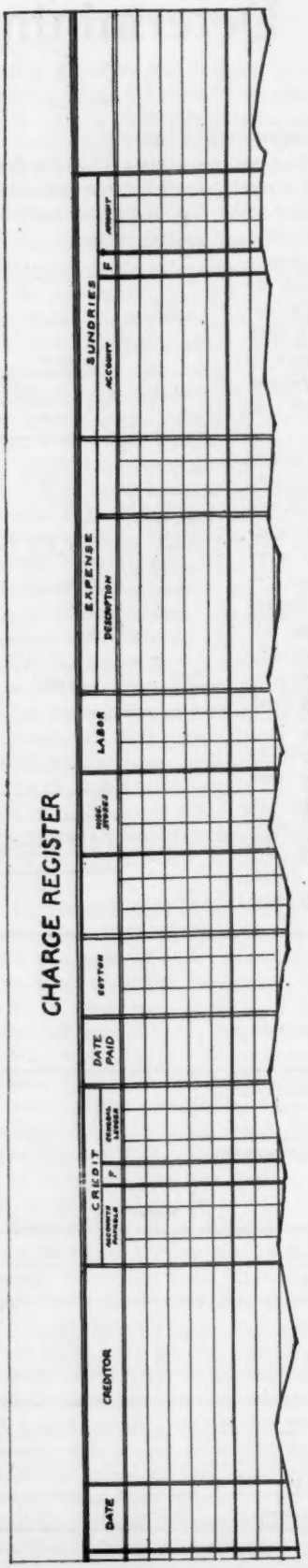


Fig. 13. The Charge Register.

item of manufacturing expense.

Accounting.

We will under this heading outline the method of obtaining the necessary figures for overhead expense with the least possible clerical effort.

If we have one book through which is posted every penny paid out in the operation of the business, we can be sure that no item of expense is overlooked.

Charge Register, Fig. 13, illustrates the forms of such a book. On this form are shown the salient points of each invoice, and how they are scattered or distributed to the various general controlling accounts, by means of columns allotted for that purpose. Once a month the footing of these columns will be carried to the General Ledger.

PAY ROLL ANALYSIS

Month of 19

	Description	Week Ended Fraction	Week Ended	Week Ended	Week Ended	Week Ended	Week Ended Fraction	Months Total.
	Superintendent & Asst.							
	Misc. N.P. Labor							
	Warehouse Labor							
	Pick Mfg. & Lap. Shore Forem. & Asst.							
	Productive Labor							
	Card Shore Forem. & Assts.							
	Productive Labor							
	Comb Shore Forem. & Asst.							
	Productive Labor							
	Draw & Slub Shore Forem. & Asst							
	Productive Labor							
	Speeder Shore Forem. & Asst.							
	Productive Labor							
	etc.							

Fig. 12. Monthly Pay Roll Summary.

It will be observed that all of the expenditures are herein set forth under the same cover in a limited space and in such form that they can be readily carried to the General Ledger and the cost records, giving far more information than is usually obtained. The column arrangement also gives, through the books, a perfect control of the cost system, proving the accuracy of the latter once a month.

On the charge register, under the heading of Factory Expense, a description column is provided. All the expenses are posted giving the department to which they are chargeable and a description of each item. At the end of

CHARGE REGISTER SUMMARY

MONTH OF 19

SELLING EXPENSE	AMT.	GENERAL FACT.	AMT.	DEPARTMENTS	No.	Mchy. Repairs	Misc. Expense	General Expense	
				Gen. Fact					
				Pick Mfg. Lap					
				Card					
				Comb					
				Draw & Slub					
				Speeder					
				Spin					
				Wind					
				Mercerize					
		TOTAL OFFICE EXPENSE							
TOTAL									
DEFERRED EXPENSES	AMT.								
Total		TOTAL		TOTAL					

Fig. 14. Charge Register Summary.

each month a recapitulation of the expense items is taken off and posted to the Charge Register Summary, Fig. 14, which gives an analysis of expenses by department and classification.

An accurate summary of the expenses each month is the important thing. It is most easily accomplished by means of the charge register which will fit in with almost any set of books. Therefore, we will not give a description of the complete set of books of original entry.

All taxes other than government income and profit taxes, insurance and depreciation are known as Fixed Charges. They are expenses that must be estimated at the beginning of each year and prorated in equal amounts over the twelve months.

Description	Asset Value	Pct. to Total	Insurance
Buildings	$200,000.00	20%	$200.00
Machinery	300,000.00	30%	300.00
Inventory	500,000.00	50%	500.00
Total	$1,000,000.00	100%	$1,000.00

The insurance amounts obtained as illustrated in the table are posted at the foot of the proper columns on the fixed charge sheet.

The building depreciation is obtained by taking the asset value of the buildings from the general ledger and applying the rate of depreciation to it, which varies from 1½ per cent to 3 per cent dependent upon the type of building construction. The total amount of building depreciation is posted at the foot of the proper column on the fixed charge sheet.

To obtain the machinery depreciation, an inventory of machinery in each department must be taken, and extended at the cost value. The department machinery values thus obtained must check with the general ledger balance of machinery, and are then posted to the fixed charge sheet under the heading "Machinery Value."

The per cent of the machinery value for each department, to the total machinery value, is figured and noted in

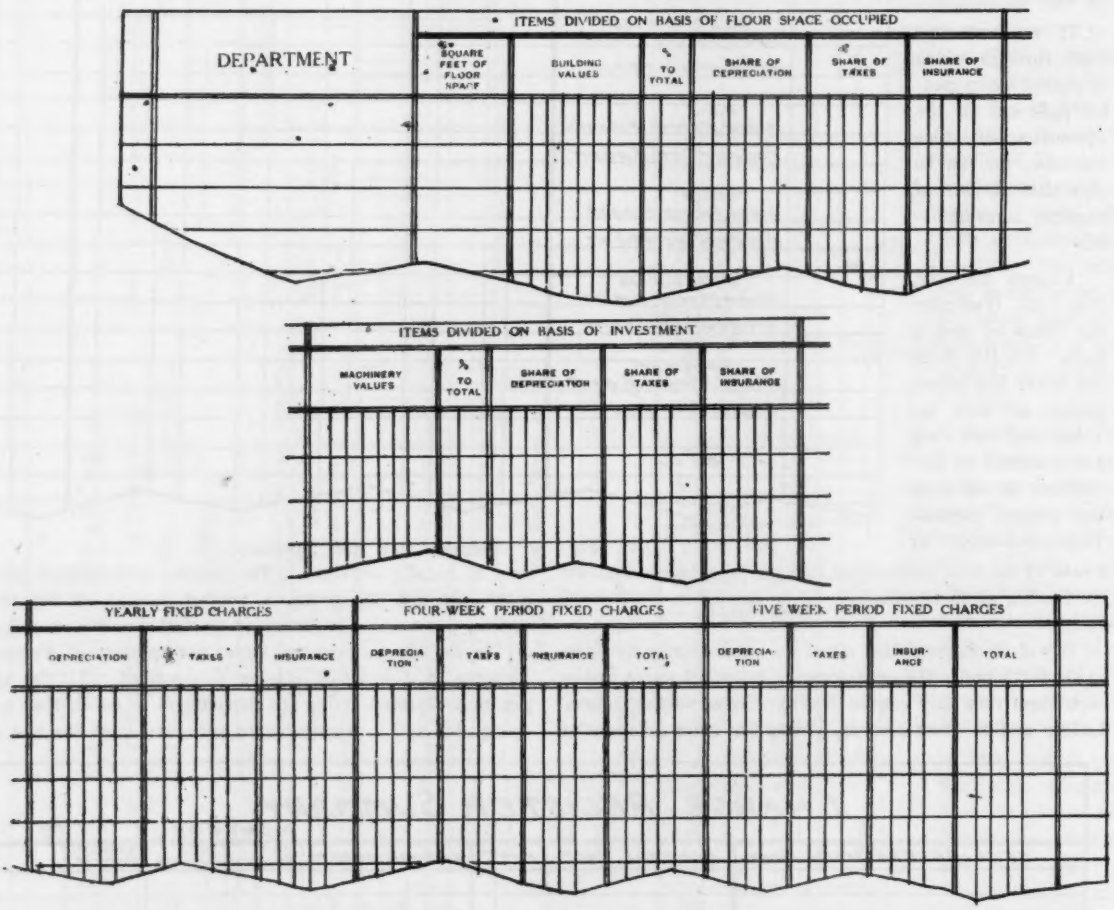


Fig. 15. Fixed Charge Sheet. Because of the size of this sheet it is divided into three separate sections for convenience in reproduction. In the original sheet the heading extends horizontally across the sheet beginning at "Department" on the left and ending with 5-week fixed charges on the right.

The total amount of taxes is based on the building value and can easily be estimated from past invoices and taking into consideration any expected increase or decrease. This amount is posted to Fixed Charge Sheet, Fig. 15, at the foot of the column headed "Taxes."

The total insurance charge for the year may be closely estimated from the insurance policies carried. The insurance covers three general items: building, machinery and inventory. The total insurance may be divided in proportion to the total average asset value of each of the three divisions as illustrated herewith:

the column provided for that purpose. The machinery depreciation for each department may then be determined by applying the depreciation rate to these figures. The rate of depreciation for machinery is usually 10 per cent.

Insurance on Inventory is charged in its entirety to General Factory Department.

The percentages of machinery value are applied to the total machinery insurance, thus obtaining the proper distribution of this item over the different departments.

The next step in making up the fixed charge sheet is to take floor plans of the mill and lay out the floor space occupied by the different departments as listed previously in this report. The square feet of floor space occupied by each is figured, these amounts are then posted to the fixed charge sheet in the column provided for that purpose. The percentage of each department to the total floor space of the plant is then figured and the percentages noted in the proper column. These percentages are then applied to the totals at the foot of the columns headed "Insurance and Taxes" and the distribution made to each of the departments.

All of the Fixed Charges have now been properly distributed to the different departments and by adding horizontally we obtain the year's Fixed Charge for each department. These amounts divided by twelve gives the monthly charge which is the amount that is posted to each department in the Expense Analysis.

[This is the second of a series of articles on yarn costs by Mr. Gordon. Another will appear in an early issue.]

Human Relationships in Industry

BY W. M. McLAURINE.

Induction.

The next phase of the work after the hiring process may be termed "Induction." This is a slightly inclusive term as I have used it. By its use I mean, the reception of the new man officially into our organization, properly instructing him, and placing him in his operative or wage earning position in the mill.

To revert to a statement that was made in the preceding article, the attitude of the help is the biggest factor of the help. It is the controlling factor in the mill. In the interview, I discussed in a rather sophomoric way how it might be made good or bad by this first contact. The same conditions which affect attitude may be present in the induction. As I have indicated above, there are three subdivisions of induction, and I shall briefly discuss each in turn. To all of us who have had to change jobs in our industrial life, there come back in our mind, the many, various and imaginative conditions that we would have in thinking of how we would feel when we really stepped into the big building as an employee, how we would be received; how the plant looked; how the people looked; how the new job would fit us; would those in authority be sympathetic and helpful; would employees render assistance or hindrance; would the employees receive us cordially into their social life and make us a member of the group at once, or would we be regarded as a newcomer and treated to indifferent isolation? These thoughts, and perhaps dozens of others of similar kind and different kind race rampantly through the seemingly calm, cool and undisturbed mind of the new employee.

The student, away in college, on the campus and in the classroom with a thousand other students may grow lonesome, despondent, despairing, indifferent, careless, hopeless. The attitude on the part of the faculty or students could have made the story different. The most lonesome I have perhaps ever been was in the heart of New York City or the loop district of Chicago. Millions of people hurrying everywhere and all indifferent to me, my success, and aspirations.

Business is business. It has no time for the niceties of life. A word, a look means volumes when given at the right times. I am not trying to describe a condition of indifference that exists, for it has been my experience that a very cordial reception is accorded most help when it comes into a new place. I am trying to emphasize it.

The first morning is a very important morning. The first hour of the morning is a very important hour of that first morning, and this is particularly true of new help.

The fact that we know someone in a little different way other than simply from an industrial association is a great asset in starting to work. The fact that some one seems interested in us and our success is a greater asset. The overseer has been our main stay so far, and we have tied our faith and confidence in him. The chances are that we shall not work directly under him, but indirectly. We shall probably work directly under someone else. The overseer should see that in the shift of the new employee to the sub-overseer that this same cordial relationship is established between the new help and the sub-overseer.

So much for the social setting of the induction problem. How it is to be done can not be described. The intuition and ingenuity of the individual if allowed normal and free play will indicate how it is to be done. It is as foolish to indicate how it should be done as to try to outline a social conversation with a man whom we have never met. The fact that it should be done is the only thing that I am particularly interested in getting fixed in the mind of the group.

In discussing the second sub-division, instruction, I think a means is offered for doing part of this.

Every job change is a new job. It may be that a weaver goes from one mill to weave in another mill. It is a new job, just the same, and the employee needs instruction. It is true that in the interview or employment period that much information has been given to the applicant who is now an employee, but this was given under different conditions and from a different point of view from what is now required. That instruction was largely casual and general. The time has now come for definite and specific instruction in company policies, plant regulations, special regulations and requirements of the superintendent as regards that group of employees, department regulations, accident and safety rules and regulations and dozens of other things that my inexperience forbids me to write. In most of the plants where I have conducted

this work, I have been unable to find anyone charged with the specific responsibility of instruction. I have found quite a diversity of opinions as to what information or instruction should be given. I have found a diversity of opinions as to when, or how, or by whom it should be given. Some have suggested that no instruction is necessary. Simply put them to work and instruct them as errors or mistakes occur. This may be the right way, but it does not seem so to me. I am of the opinion that we have proceeded in an expository way to the point now where some real conference work can be done.

What instruction is necessary for new help? When shall it be given? How shall it be given? Upon whom shall the responsibility be placed?

Taking up the first question, "What instruction is necessary for new help?" causes us to revert to the discussion of Job Analysis, as perhaps an inclusive part of the program. The entire instructional material can be brought out in a conference discussion. Below are a few suggestions as to the class of subject matter that has been developed in certain conferences.

1. Company policies, i. e., those that affect all workers.
2. Plant rules and regulations.
3. Safety.
4. Hygiene and sanitation.
5. Plant practices and methods.
6. Kinds of machines and operations.
7. Qualities of production.
8. Quantity

Normal or Standard.
Average.
Capacity of machines.

9. Weaknesses or caution points of processes.
10. Waste

Normal.
Excessive.
Disposition.

11. Variations in quality and quantity.
12. Variations in abilities of different workers of the same class.
13. Imparting special information regarding special machines and special jobs.
14. General subjects on which the employer thinks the worker should be coached.

It seems to me that there are certain definite instructions that should accompany each job. Those who have this in mind in a general way have a general idea as to what this instruction should be. The one great fact of industrial business is that it progresses on facts and accurate knowledge. When these are absent, success is problematical. A natural deduction from this statement seems to be that for all new help there should be definite available instructional material and it should be given in a systematic way by a responsible party and so recorded. If an entire list of information necessary to be given has been made so that the one charged with this responsibility can have a clear conception of his duty, this point will be clarified.

It may not be necessary to instruct on every point or in detail, as the new employee may not need it, but it is necessary for the person so charged with the responsibility to be able to know what he needs and what he does not need.

Many industrial plants, including some cotton mills, have rules, regulations, instructions, etc., written out or printed in a pamphlet. When a new employee comes in he is given one with the injunction that he must be guided by that. This has not been found satisfactory nor sufficient. There is a vast difference between giving information and instruction. When the leader is giving information to a group, it is possible for only one mind to work and that is the mind of the informer. This is sometimes called "the telling process." When a class is being instructed, if every member is being instructed, the mind of each member of the group is working and the possibility of receiving the information or subject matter under discussion is much greater.

There is an old rule of psychology that applies to the teaching process, "No impression without expression." This is as true in the factory as in the schoolroom. In the instruction program there must be some reaction on the part of those being instructed, or there will be nothing to indicate the success of the method.

Again, in the instructing program it must be remembered that there are no two minds alike, particularly in respect to receptivity and interpretative ability. All have different backgrounds and interests. All of these determine how we receive and interpret new information.

To use a homely illustration that a friend of mine related to me: He was needing a new straw hat. This fact had been on his mind for several days. His wife had gently, but firmly impressed this fact upon him. Sunday had just passed with further entreaties on the part of his wife that he should get this hat. Monday morning at breakfast she told him again. Hastily he grabbed his morning paper and started to town on the street-car. He unfolded his paper to read, and the first thing he saw was, "Good Hats a Quarter." He eagerly adjusted his paper to see where this bargain place was, and found that some noted minister had preached the day before and his theme was—"God Hates a Quitter." Our mental attitude at the time of instruction is given has much to do with our reception. There are many other instances that could be cited, but space forbids.

For this reason, I want to emphasize the fact that telling a person should not relieve us of our responsibility. Our responsibility does not cease until the second party has the same idea of the instruction material that we have. Again, the law of remembering and forgetting is a factor that the overseer should keep in mind. The facts we know today, unless opportunity to use them is afforded, are soon forgotten. Psychologists tell us that we forget about eighty percent of unused material in about thirty days.

This should be taken into consideration in our instructional program. Instead of trying to do all instruction at one time, it should be so distributed as to be most effective and available at the proper time.

This could very profitably be settled by the conference group, viz., when the instruction of various types should be given. The question now arises as to how this instruction may be given in the most effective way. A discus-

(*Continued on page* 523.)

Air Conditioning Practice in Cotton Mills

By Albert W. Thompson
Vice-President Parks-Cramer Company

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Ring Spinning. Roving from the fine roving frame is fed into the draft rolls of the spinning frame and is often doubled. Exposed on the surface of the roving bobbin in the creel and fed in slowly as it is, it tends to absorb moisture corresponding to the humidity of the room. The spinning frame rolls give to this roving the final and usually the greatest draft of the process. Since this process is final it is important that the moisture content at this stage be most favorable to an absolutely even drafting; to the development of that peculiar clinging tendency of the fibers which enables the twist to pack them together closely, evenly, and smoothly.

During the actual spinning and while taking the twist, the yarn is being whirled rapidly about by the spindle and traveler. It is exposed to the air in the immediate neighborhood of the spindle which is considerably hotter than the room air. Therefore freshly spun yarn contains a smaller amount of hygroscopic moisture than that of the roving entering the draft rolls of the spinning frame. The difference, however, is slight and practically constant.

The humidity of the spinning room, aside from its effect upon processing, is a very important factor in its effect upon regain. We have in this department an excellent opportunity for securing regain in the product which may be relied upon to protect the seller. Here we should prevent the loss of any part of the value represented by the material itself—and the labor expended upon it. Much of the profit to which the spinner is fairly entitled may be lost if this precaution is neglected.

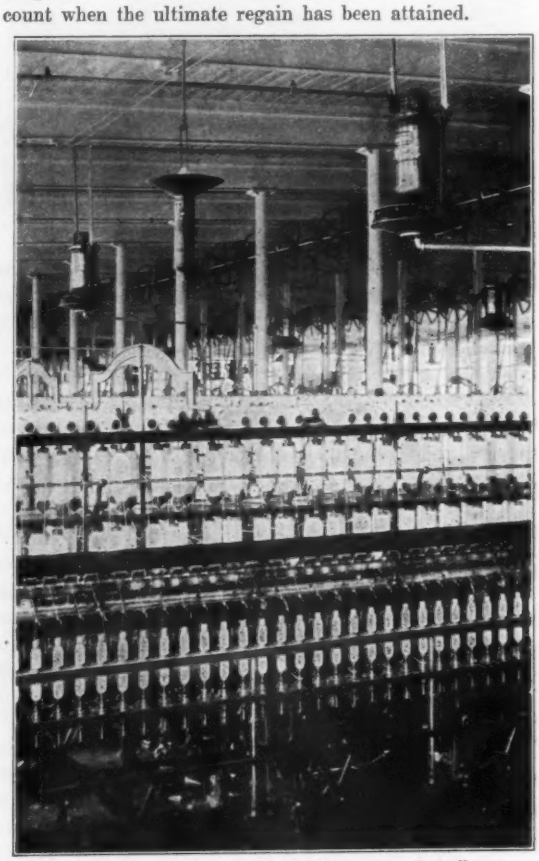
If the spinning room humidity is too low, not only will production suffer but an excessive dry-weight of material will be required in each hank to keep the yarn up to count. Proper regain is the legitimate substitute which the spinner should provide for this unnecessary and excessive dry-weight—legitimate because the yarn will not only gain thereby in strength and every other desirable quality, but will proceed to the user with a natural and proper moisture content which he welcomes.

A relative humidity of from 55 to 60 per cent at ordinary temperatures will result in satisfactory processing under ordinary circumstances, but the regain realized under these conditions is likely to fall short of the protection which the spinner should require. Best processing combined with satisfactory regain will ordinarily be realized at ranges of from 60 to 70 per cent relative humidity.

A strand of yarn is an assembled structure and in a relatively moist condition the fiber lends itself much more readily to the structural requirements. Experiments have indicated that the improvement in quality which follows an increase in the humidity seems to reach its maximum at about 60 per cent. Very high humidities add apparently little to the quality of yarn except in the case of special products.

The requirements of a particular product should be studied with care to ascertain what relative humidity will produce the best result.

A word of caution should be added here against relying solely upon humidification in the spinning room for producing the desired final regain in the finished product. The regain actually realized by favorable atmospheric conditions in the spinning room should be further safeguarded or even augmented by proper humidification during such subsequent processes as twisting, spooling, winding, and packing for shipment. Having exercised this precaution it will then be safe to allow the yarn as freshly spun to run somewhat on the light side as to count, provided the dry-weight is maintained sufficiently high to ensure correct count when the ultimate regain has been attained.

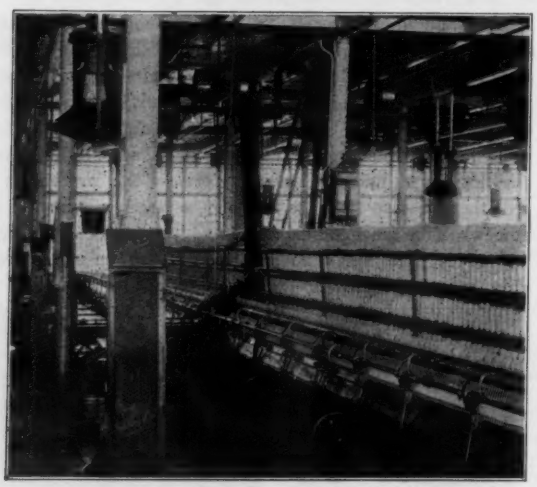


This Room Contains 50,000 Spinning Spindles

Mule Spinning. The mule is almost obsolete in the manufacture of cotton yarns, except for such special products as the very finest counts, soft twisted hosiery yarns, and certain coarse, soft yarns for special purposes manufactured largely from waste.

When using the mule for these products the roving is so delicate and tender that the slightest trace of static electricity is fatal. The strain to which the delicate strands of yarn are subjected while suspended between the rolls and the retreating spindles exposes them to breakage at the slightest weakness.

During the recession of the spindles, the twist tends to run most into those portions of the strand which are lightest, permitting the heavier portions to stretch slightly under the tension before they receive their share of the twist. This considerably improves the evenness of the yarn. It is difficult to specify the proper humidity for mule spinning because the degree depends upon the nature of the product manufactured. Relative humidity should be high



Mule Spinning.

enough in any case to eliminate static, the minimum being about 50 per cent. It may be as much higher as is warranted by visible and consistent improvement in spinning. Some successful mills operate mule rooms at from 65 to 70 per cent.

Stability is especially important. Variations affect tension and cause breakage of ends; little benefit would be derived from high humidity without effective control.

High Humidity for Cotton Spinning. While proper humidity is necessary for cotton spinning, it is important that the humidity should not be too high. If we gradually build up humidity the improvement noted at first will practically cease when we reach a certain point, depending upon fineness of yarn, age and staple of cotton, and other local conditions. If we increase humidity beyond this point, yarn begins to spin poorly, especially in the case of fine yarns. Coarse yarns will generally support a greater increase in humidity than fine without unfavorable results.

The relative delicacy of fine yarn probably accounts for its especial need for humidity as insurance against static electricity. Its susceptibility to bad effects from excessive humidity as compared with coarse yarn is probably due to the more bulky roving used for coarse yarn and the greater rapidity with which it is spun, allowing less time for the effects of atmospheric moisture to operate.

We find that mills which produce sales yarns in great variety seem to rely upon higher humidity for spinning coarse yarns than fine. On the other hand, we find in cloth mills whose spinning machinery is especially adapted to the production of their particular staple yarns, fine yarns are usually spun under higher humidity than coarse.

Among those engaged in research on this subject, the belief seems to prevail that the finer the yarn, all other things being equal, the higher the humidity which will cause it to spin best, but many practical manufacturers hold that coarse yarns require higher humidities than fine. These differences in opinion may be attributed to the inequality of the conditions in different factories and in different departments of the same factory. For instance, it is not uncommon to spin two different yarns from the same drawing sliver or comber sliver by differentiating in the roving processes, but in any such case the material clearly must be better suited to one product than to the other.

In selecting stock for spinning different yarns in the same factory, it is common to use a superior cotton of good staple for fine yarn and a materially lower quality for coarse. Since the latter needs the assistance of increased "hugging" and surface friction for tenacity in spinning, it would be quite likely to require higher humidity than the finer yarn which has the advantage of better cotton.

Again, the humidity requirements in the spinning room might depend very directly upon the quality and suitability of the roving available. For instance, if the roving be of good quality and the carding and roving departments well humidified, the roving would reach the spinning frame in favorable condition, and that fact alone would go far toward assuring good spinning. If the reverse were true and the roving dry and uneven, it would be much more difficult to conclude what humidity would produce the best results.

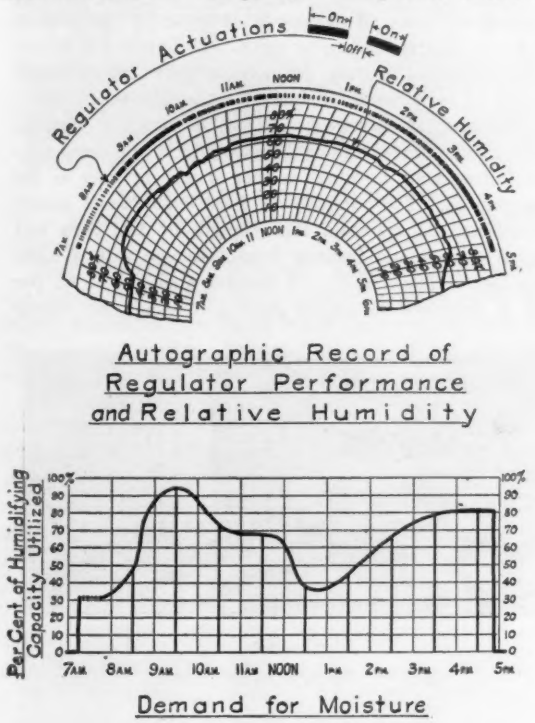
These observations indicate the difficulty of prescribing conditions of humidity to fit all cases. The manufacturer should seek to eliminate such other disturbing factors as there may be before attempting to determine that particular level of humidity which is most suitable for his product.

Cause and Effect of Fluctuating Humidity. A spinning room, more than any other department of a cotton mill, is exposed to variations in relative humidity. The temperature tends upward as the heat of the day increases from its morning minimum toward its mid-afternoon maximum and as the machinery warms up. The rising temperature tends to rapidly lower the relative humidity. Thus there is created a rapidly increasing demand for evaporated moisture to maintain relative humidity and keep the room temperature within bounds. Fluctuations in relative humidity in the spinning room affect belt tension, machine speeds, and power consumption; band tension, spindle speeds, and twist per inch; actual or effective draft, amount of fiber lost as fly or clearer waste, and regain. Variations in the quality and count of the yarn always follow closely any marked variation in the relative humidity.

Assume, for instance, that we have a favorable humidity. Our spinning room is running smoothly with as low a twist as the product permits and a draft and roving weight which produce the desired count. Now if the humidity falls off for any considerable period the work begins to run poorly; ends begin to break down; fly and waste in-

crease and the yarn becomes weaker, uneven, and off-count. We may succeed in relieving these troubles somewhat by increasing the twist and altering the draft, but the yarn will not be as even nor as strong as before; waste will continue to be excessive. We shall have manufactured a considerable amount of distinctly inferior product before the change in draft and twist becomes effective. If the humidity returns again to a higher value the yarn again quickly runs off weight and once more draft and twist must be altered.

Under varying atmospheric conditions corrective measures must necessarily lag considerably behind the development of the fault. The quality of the product cannot be



Autographic Record of Regulator Performance and Relative Humidity

Demand for Moisture

Fitchburg Yarn Company
Spinning Room
September 20, 1923

Fig. 1.

consistently constant but must hover above and below an average which represents the result of the spinner's best efforts to compensate for the changing conditions.

Even when the spinning room has ample humidifying capacity the relative humidity often varies twenty to thirty per cent in each working day with ordinary supervision and manual control. Consistent quality and quantity of product require stabilization of humidity, which can only be produced by adequate capacity and automatic regulation.

Moisture Demand. The demand for moisture from a humidifying system is just as real as the demand for heat from the factory boilers. An autographic record of the performance of an automatic regulator in control of an adequate humidifying system enables us to measure the demand for moisture—to show graphically how it varies and to what extent the capacity of the humidifying system is utilized throughout a day's run.

The record of a day's run in a cotton spinning room is shown in Figure 1, together with the corresponding record of the demand for moisture. The upper semi-circular chart records the operation of the humidifiers from shortly after 7:00 a. m. to 5:00 p. m. by black dots and dashes near the outer margin. These show when and for how long the regulator kept the humidifiers on the intermediate empty spaces indicating the intervals of non-operation. The simultaneous record of relative humidity is indicated by the continuous line.

The average demand upon the humidifying system for

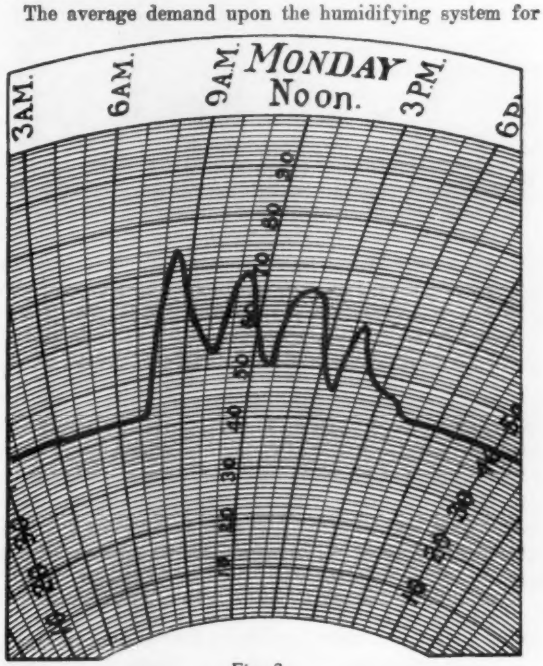


Fig. 2.

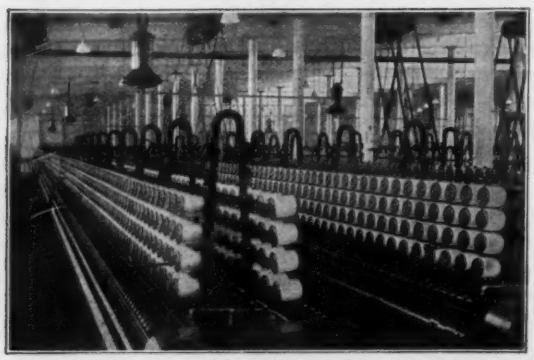
each successive hourly period, as derived from the regulator record, is represented on the lower chart by heavy vertical lines whose respective heights show the "load factor" for each hour, scaled to indicate the percentage of total humidifying capacity utilized. The curve connecting the upper ends of the verticals indicates the demand for moisture, which was quite irregular, although there were no sharp changes in the weather during the day, such as the arrival or departure of a storm would have produced.

The outdoor temperature was 57 degrees at 7:00 a. m. and rose to 68 degrees at 3:30 p. m. Cloudy weather prevailed with a light wind; the relative humidity outside ran close to 60 per cent throughout the day.

After the room had once been brought to the proper humidity, the first period of increase in the demand for moisture was due to a gradual rise in temperature and a progressive opening of the windows. Such an opening of windows is customary and quite proper in the summer time. About 9:30 there was a sudden change in the direction and intensity of the wind, accompanied by a fall in temperature indoors which caused the demand for moisture to diminish. The sudden drop in the demand for moisture during the noon hour, due to the shutting down of the spindles and the removal of their heating influence, is

quite usual. During the noon hour windows were partially closed and progressively opened again during the afternoon to keep the room cool. This accounts for the progressive rise in the demand for moisture during the afternoon.

There is nothing particularly unusual about this record. It is introduced to show how the demand for moisture



Twisting.

fluctuates even under ordinary conditions and to indicate the nature of the task which a regulator must perform in stabilizing the humidity.

The record of relative humidity shown in Figure 1 should be compared with that shown in Figure 2 from the spinning room of another mill which had ample humidifying capacity but no automatic regulation. In the latter case humidifiers were operated until observation showed the humidity was too high, when they were turned off manually until it fell too low. Here we have an average relative humidity of about 60 per cent for the day as a whole but with fluctuations between extremes as high as 74 per cent and as low as 46 per cent.

Good capacity without regulation permits better processing and more satisfactory regain than is possible in an unhumidified mill; but with such wide variations in humidity no uniformly good results can be expected such as are realized under the uniform conditions secured by auto-

Winding.

matic regulation as illustrated by the first set of charts.

Stabilizing Regain. A great many mills, especially those engaged in the manufacture of yarn for mechanical fabrics or hosiery yarns, pay very careful attention to the factor of regain.

It is not unusual for mill managers and engineers to think and speak of atmospheric conditions in terms of regain.

It is entirely possible and desirable to practice automatic regulation on a regain basis. That is to say, the regulator may be set so that as the temperature rises or falls during summer weather, the humidity will be correspondingly increased or lowered and the relation between temperature and humidity will then at all times correspond to a selected value of regain.

The automatic humidity regulator in a spinning room may be set so that the humidity will vary with the temperature according to the law of regain, and regulation of the humidity by this method may be used to stabilize the regain in the product. Experience with this practice proves that when, as in hot weather, the mill temperature varies through a considerable range between morning and mid-afternoon the processing will nevertheless be uniformly good.

Processes Subsequent to Spinning. Twisting, spooling, warping, and winding are not manufacturing processes in the same sense as carding or spinning. Twisting is a process of assembling two or more already manufactured strands of yarn into a product of different form. Spooling, warping, and winding are used to transpose yarn already manufactured into a condition or form more suitable for weaving, knitting, or sale to the customer as the case may be. The humidity in these departments should be sufficient to maintain the strength of the yarn and keep it smooth and immune from breakage with a minimum loss of fibers as fly. A relative humidity of 65 per cent is sufficient to ensure good processing, but higher

Warping.

humidities are often required to produce the desired final regain.

Twisting machinery, like spinning machinery, liberates considerable heat and calls for high humidifying capacity to keep the temperature down and the relative humidity up.

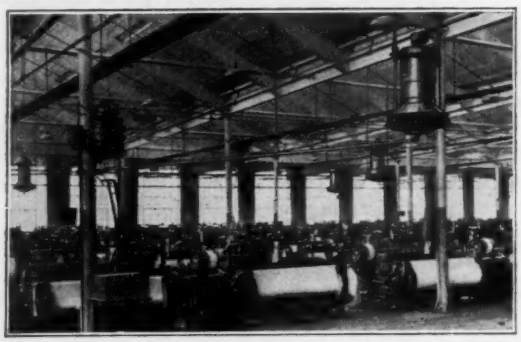
Weaving. Good processing is of the utmost importance in weaving. Faulty operation of any kind will be reflected by more or less visible imperfection in the product, impairing its quality and value.

No matter to what extent inspection, selection, and separation of imperfect goods are practiced, seconds and remnants represent heavy losses to the manufacturer. They are not only sold at lower prices but actually cost more than perfect goods. Every imperfection caused by the breakage of filling or warp threads represents stoppage of the loom while the break is being repaired, increasing cost as compared with goods of first quality. Further expense is entailed in the disposal of seconds through special channels at concessions in price.

In a cloth mill, the weave room production determines the annual volume. It is here that the cloth manufacturer's percentage of overhead is determined. Every additional yard of cloth produced by improved efficiency increases the available profit, decreases the ratio of overhead, and reduces the net cost of production. While these facts are

apparent we stress them here because they so frequently seem to be overlooked.

In the weaving of plain goods there is a steady improvement in production and a diminished percentage of stoppage as relative humidity increases up to about 75 or 80 per cent. This is chiefly due to the increase in strength

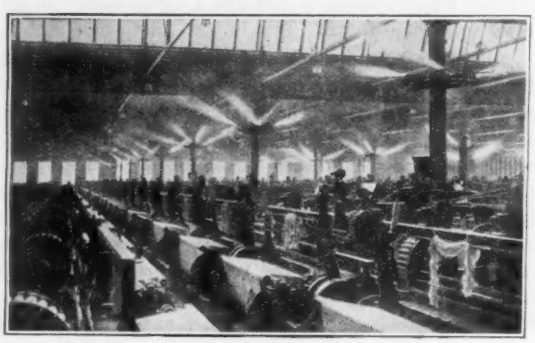


Weaving—High Duty Humidifiers.

which cotton yarns derive from an increase in moisture content.

High Humidities in Weaving. There are, especially in the South, many mills which practice weaving under far higher humidities than those which we have recommended for general practice. In some cases there are excellent reasons for high humidity.

Many southern mills manufacture print cloths, sheetings, and similar goods from cottons of staple as short as 7/8 inch, while northern mills generally use 1 1/16-inch staple for such goods. In the former case the yarn requires considerably more twist for proper spinning and adequate strength. The harder twist increases the tendency to kink and makes the yarn less quick to absorb hygroscopic moisture. On both accounts the need for higher



Weaving—Turbo Humidifiers.

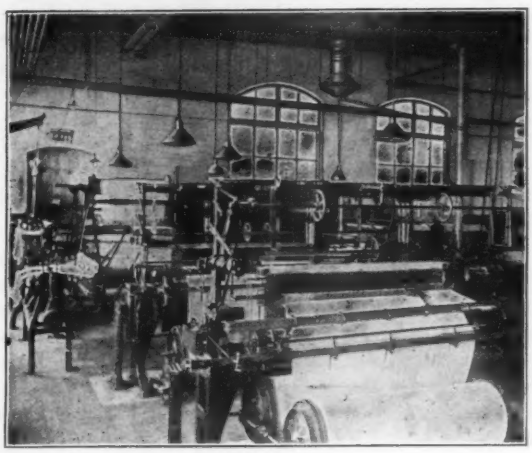
humidity is evident.

With automatic looms, so widely used in southern mills, warp breakage should be reduced to the lowest possible limit. Otherwise there will be such serious stoppage that weavers cannot operate a proper quota of looms.

When only six or eight plain looms are tended by one weaver a certain number of warp yarn breaks may be tolerated without serious losses because they may be so quickly reached and mended by the weaver. When from thirty to forty automatic looms are tended by one weaver the same amount of breakage would lead to such a large percentage of idle looms that it would represent an intolerable loss in production. Any increase in humidity which perceptibly reduces warp breakage secures an important improvement in the production of automatic looms, and high humidity thus becomes especially valuable in such cases.

Numerous mills weaving heavy twilled cotton products, especially those with dyed warps, on automatic looms, find it necessary to size such warps very heavily. These mills practice very high humidities to prevent the generation of objectionable dust originating from size and to keep the warp in the best possible condition for weaving. In such cases humidities as high as 85 or 90 per cent are used and are favored by the operatives themselves because the improved production increases their piece work earnings.

The higher the humidity used in weaving the more necessary is its stability, for there must be no changes in harness tension, warp tension and shuttle friction such as result from fluctuating humidity. The introduction of



Courtesy of Barber-Colman Co.

Warp Tying.

regulators in well humidified weave rooms makes possible not only constant humidities, but higher humidities than are feasible without automatic regulation. The weaver soon finds that much better production results from a high humidity, provided it be stable.

Warp Tying. The extent to which humidity increases the ability of yarns to stand manipulation is well illustrated in the operation of automatic warp tying machines, and an instance may be appropriately described here.

A large mill which was tying in all of its coarser warps with automatic warp tying machines ordered a similar machine to be tried out on its finest goods. The machine was set up in a small enclosure partitioned off for the purpose from space available in a large dressing room. When started, the warp ends broke so frequently under the action of the "selector" that the overseer of dressing and the machine demonstrator were on the point of admitting complete failure when the overseer of weaving suggested a trial of a humidifier. The existing humidity was found to be about 40 per cent. When the humidity was increased to 60 per cent the breakage at once ceased except when a weak or imperfect thread was encountered, and the machine performed just as perfectly as on the coarser goods. An annual economy of thousands of dollars was thus made possible.

The automatic tying of fine warp yarn requires that the yarn be strong enough to permit a practically continuous operation of the machine without interruption from breakage. Humidity in the warp tying room should be high enough to ensure the requisite strength of the yarn in process.

Because of its effect upon yarn strength, adequate humidity is also of paramount importance for the successful operation of improved machinery for spooling and warping at high speed. Recent improvements in textile machinery have been chiefly addressed to a reduction in the labor required to piece up broken ends. For economical operation, machinery of these highly developed types needs all available gains in yarn strength which can be secured by increased humidity.

Cloth Room. Humidity in the cloth room is important in the handling of plain fabrics sold to close specifications as to the weight per yard. Under these conditions it is important to retain a proper regain in the product as packed and invoiced. Humidities of 65 to 75 per cent will serve this purpose. Fancy or colored goods are often washed, sized, calendered, tentered or otherwise mechanically treated to produce the desired finish and condition, and humidity is not important when finished weights are controlled by other means.

[This is the second of a series of articles on Air Conditioning Practice by Mr. Thompson. Another will appear next month.]

Fall River Men Discuss Weave Room

The weave room was considered and discussed in the third meeting of the series being conducted at the Bradford-Durfee Textile School, Fall River, Massachusetts, for the operating executives of that city. The meeting was held on Wednesday evening, December 12th, and in opening it, H. W. Nichols, principal of the school, said: "Arrangements for this meeting tonight, which I presume all here know is for the discussion of weave room topics, have been made by the committee on weaving, of which Richard Molyneux is chairman."

In opening the meeting, Mr. Molyneux said, "Some time ago I was selected to act as chairman of the committee on weaving. My committee gave considerable thought to the question of a speaker for this meeting. We finally came to the conclusion that Frederick B. Hays, instructor in the Bradford-Durfee Textile School, would be just the person. We consider ourselves very fortunate in having secured the services of Mr. Hays. If during his talk there are any questions anyone would like to ask, we want them not to hesitate to do so. This meeting is for the mutual benefit of all of us. After Mr. Hays' talk the meeting will be thrown open to discussion. At that time if there are any problems you feel you would like to have discussion on just bring them before the meeting."

Mr. Hays' address consisted mainly of describing various weaves and constructions, and explaining some of the difficulties in the making of the various cloths. He exhibited samples throughout the course of his talk, and though it is impracticable that these be reproduced in this report, still his comments upon each sample and his suggestions may be readily understood and appreciated by the practical man reading this article.

In beginning, Mr. Hays said, "I have brought here a good many cloths, some made in Fall River mills, some in outside mills, and I thought you would probably be interested in my telling you of some of the troubles of others that have been brought to my attention with regard to the making of these cloths.

"The first cloth to which I call your attention is an osnaburg 30 inches wide, 36 x 32 per inch, 4s warp and 6s filling. I would like to know if there is any carder or spinner here who would like to run a mill making that cloth. Just imagine the pounds of weight you would have to turn off to keep a lot of looms going on such a cloth as this. We certainly are willing to have competition on this cloth, even though we have plenty of skill here to make it should we desire to bother with it. One of the troubles found in making this cloth is with the shuttle. I do not care where the mill is located, it cannot hold its own in making a cloth like this unless it has the latest and most modern machines.

"One of the difficulties we have these days when seeking an instructor is to find one who not only knows his subject but one who can impart his knowledge to the students. There are any number of men thoroughly versed themselves in certain subjects but who have not this ability. Here is a plain sheeting and here is a crinkled seersucker and here is a crepe fabric. Each of these is a plain weave but will some of you tell me what a plain cloth is? I do not doubt you all know what it is. (No answer from audience.) I am not surprised you are unable to define plain cloth. The cotton manufacturers association took three months to find a definition which they considered satisfactory and consequently you and I could hardly be expected to do it offhand. This is how they define it:

"'Plain cloth is made by interlacing single warp and filling yarn of approximately standard twist woven at a uniform tension and each half of the warp threads drawn in uniformly and alternately and each thread of the warp passes over and under each thread of the filling.' The adaptability of plain cloth is unlimited and its usefulness is universal. It is always a pleasure to see a well made piece of plain woven cloth, free from yarn or weaving imperfections and where the full benefit from the balance of warp and filling is given resulting in the production of a cloth which possesses an even surface and fullness to the feel.

"I believe we have all had more or less trouble with sheeting. I know I had a good deal of trouble with it becoming ridgy. Sometimes this would happen because we did not have quite heavy enough tension on the warp; sometimes it would happen because the fixer would have one shed tighter than another or one a little stronger than another. Then, again, sometimes it was due to the whip roll being so low there was not enough cover on the top.

"I suppose most of you men know how seersucker is made. It is a plain weave cloth and we put on a top beam which we do not weight quite as heavily as the bottom beam. The top beam is drawn 2 ends in an eye, 4 ends in a dent, where we want the crinkle. Sometimes the claim is made

that the cloth is too heavy for the purpose it is to be used for and a crinkle is wanted with single ends. In this case if you have any leno easer rods use one of these instead of a whip roll for your top beam. Fasten a strong spring to the arm of the easer bar and a strap on the upper part to the loom arch and you will be able to get a fairly good crinkle."

Taking up a sample of crepe, Mr. Hays continued, "Most of you have had something to do with this sort of cloth. The standard of twist for crepe is very much higher than for regular warp twill, so we take the square root of the counts and multiply by seven and sometimes as high as eight. I had someone ask me last evening about conditioning filling for crepe yarns. We know that when it is just spun, and the spinner knows it much better than we do, that it is going to kink. I will give you one of the methods that I have found to be satisfactory. If any of you men know of anything better do not hesitate to speak up.

"We obtained the best results by putting live steam on the yarn for twenty minutes, shutting it off and turning steam on through pipes for four hours. Do not use any bobbins in the steaming process that are not enameled, for the live steam would probably cause the filling to become stained. Do not condition too much yarn at a time. Plan to condition just enough for your use for if you have too much yarn that is loose on your bobbins it will be wasted; that is, yarn you have already conditioned—it will get slack on the bobbins. If you find any bobbins in this condition, put them in the steam chest with live steam for a short time and use for weaving as soon as possible.

"I have here crepe of another type. This one is warp twist and the standard is eight. There are right hand and left hand twists in that and it is very difficult to hold in the loom until you have your tension properly adjusted so that it may be woven without kinking. The filling is artificial silk but there is no extra twist in the filling. The cloth takes the same effect as the bandage fabrics you saw so much of during the war.

"This next sample is long cloth. We make it in this city. This sample, however, is from some cloth made in Berkerly. Sometimes we are given a piece of long cloth that has been bought finished and we are asked to weave a sample similar to that. If you put the same count, reed and pick, warp and filling in the loom after it is finished it will not resemble at all the sample you were supposed to match. The reason is that long cloth is usually woven with more picks than there are ends per inch but the finished cloth has usually more ends than there are picks per inch and that comes through the cloth being woven, say, 40 inches wide and finished 36 inches. It gives a soft feel to the cloth, and a 'clothy' feel, as we say, that we would not get if we were to put in our sample cut with the same count as the finished goods have. Constructions vary from 64 x 76, 36 warp and 36 filling up to 104 x 108; the average weight of the goods is about five yards per pound.

"Long cloths are sometimes finished for percales. They are given a gloss finish and small clean patterns are printed on the fabric. These percales are sometimes used for shirtings but more frequently for women's house dresses. With looms fitted with let-off motions there was considerable trouble in getting enough tension on the beams to produce a smooth even cloth, but by using a weight rope or chain more satisfactory results were obtained."

The next sample discussed was a cambric, which, Mr. Hays said, is very similar to long cloth. "It is extensively manufactured in New England," he stated, "from both carded and combed yarns and in a variety of constructions; warp yarns of 36s to 50s and filling from 44s to 65s, the ends and picks per inch being about 84 x 88 for the lower counts up to 104 x 116 for the finer yarns. It is used largely for infants' apparel and women's undergarments. There is also manufactured a cheap cotton fabric under the name of cambric, which is dyed in plain colors and used for lining women's dress skirts; of this there are two varieties called, respectively, *Kid Finished* and *Glazed Cambric*. The latter is commonly put up in rolls, while the former is folded in yard laps and is known in the trade as flat cambric.

"In weaving what is termed the "better finish" cambric the weaver has to be very careful of imperfections for the buyer of this fabric is very critical as a rule. Some of the weavers try to conceal defects in cambric by rubbing castile soap over the fabric. This is very apt to pass by unnoticed. Other weavers use wax and then the mill making this cloth is sure to have trouble, because in the first process of finishing the wax becomes insoluble and it costs more to remove it than the cloth is worth.

"Here is a fine plain nainsook; this is one of the best plain cloths manufactured. There are many grades of nainsook but they average 8.5 to 9 yards per pound, 36 inches wide. A range of these will vary from 80 x 84 to 130 x 176. The looms require to be carefully 'set' for these and every care must be taken to keep the cloth free from imperfections as the fabric is usually made into garments where every inch of cloth is inspected. Another thing about nainsooks: After the goods are bleached there is some China clay used on the cloth before the goods are 'beetled' and it is very common for the weight to be from 25 to 30 points heavier than when the cloth was taken from the loom."

Taking up some samples of voiles, Mr. Hays explained, "One of these is an imported sample and supposed to be of extra quality, the other is a local product. From analysis of both I believe our local product is better than the imported. The crisp cool feel of this cloth is due to the warp and filling both being twisted the same way. It is essential that voiles be kept free from thick and thin places.

"This next is a sample of India linen, a cotton fabric made of fine combed yarns. These are made in a range of twelve to fifteen qualities but all average about 13.5 to 15 yards per pound. In weaving these the lay has to be brought up to the fell of the cloth; the harnesses are then set level, the temples are removed, and great care is taken that there is no friction at the breast beam.

"This next is another sample of fine combed yarn fabric known as 'Batiste.' You need good weavers for its production and if a weaver has too many looms to give them proper attention the result will be defective cloth. A mill has to get a good price to warrant such attention. The setting of the loom for Batiste is the same as for India linen."

Discussing next a sample of Tarleton, Mr. Hays said, "This, too, requires a great deal of care in the making. In weaving this cloth we have to dispense with the fixed whip

roll and adjust a round polished roll set in a Durkin thick and thin place preventer. The breast beam requires an enameled or a glass rod on the edge and the sand roller should have 00 glass paper for covering. Some of you may not have seen the Durkin device, and, for the benefit of these, I will draw a diagram and explain it as clearly as possible."

"Might I ask what the construction of this particular sample (Tarleton) is?" asked a member.

"About 22 x 22, 80s warp, 120s filling. There are some made from 100s warp up to 150s filling," answered Mr. Hays.

"What are the uses of that cloth?" was the next question.

"It is largely used for fancy costumes, ornaments, etc.," was Mr. Hays' reply.

The next sample taken up "is known as 'Penelope Cloth.' It is usually made of double and twist yarns. You often find some cloth man who wants this made. If you can get out of weaving it do so as it is difficult to make perfect and any mispicks spoil the whole. Under no circumstances attempt to use automatic looms.

"Bedford Cord is a cord cloth having an excess of ends over picks and in weaving it is necessary that the two threads weaving plain in the furrows are drawn in different dents and that any wadding threads should be in the middle of two face ends in one dent. It is necessary that the yarn be carefully sized or the yarn between the reed and the harness will 'buckle,' particularly if drop wires are too close together.

"Pique is a cord cloth and from the weave room standpoint the trouble is to beat up the picks as they are very much in excess of the warp yarn and when heavy wadding filling is used it requires a strong lay.

"If you should chance to have, as I have had, some of these light looms that were made to run light weight goods and have not a lay of great enough strength when you have to put one of these in, you find the lay buckling and throwing the shuttle off. One way of overcoming this trouble is to put an iron plate on the lay.

"Corduroys are better woven with cams than with dobby heads but we do not always have cams and sometimes they want us to make this cloth up right away and we have to make it on the dobby. As there are anywhere from 220 to 400 picks to the inch it is necessary to have a strong tension on the beam when the lay beats up the picks. One of the methods is to put a steel strap around the flange of the beam. One end of the strap is attached to a rod and the rod is connected with the lay sword so adjusted as to hold the beam firm when the reed strikes the cloth.

"It is claimed that this country cannot make Swiss muslin to compare with that which is imported. I take exception to this statement for I have seen Swiss muslin that has been made in local mills which is of even finer texture and better appearing cloth than that which is imported. It is such a difficult cloth to make and requires so much attention that many of the mills do not care to bother with it. It is made from double combed stock and is run through very slowly. I believe it is of even more trouble to the carder and spinner than to the weaver. You know that a mill making this cloth does not attempt to run eight hundred to one thousand pounds per card per week.

"I have here a piece of drill used for making barbers' coats and sailors' white uniforms. I have another cloth of similar type—a gaberdine. They are both twill weaves. The first cotton gaberdines that we used to make were called galatea cloth and we had to use hard twist yarns. We used two beams, yet it was only eight harness weave. Mills making this cloth had to get a high price for it but the buyer would have difficulty in wearing it out due to the firmness of texture.

"Here is a cloth with heavy cords and an extra filling figure. Many of you men have had trouble with cloth coming from finishers with cords broken. If the twisting machine had water in it when the yarn was twisted there would be no breakage when the cloth was finished. After the bleaching process of finishing, the stretching of the cloth in order to get an even surface is too much for the cords and they break.

"This is a sample of cloth known to the trade as Ondule cloth. This is made by using a reed about 15 inches deep and the dents are set at angles. The reed works in a slot and there is a ratchet which raises and lowers the reed making the cloth contain more ends per inch at one point and the same dents giving fewer ends per inch at the other point. This gives a shadow effect and when woven in combination with cords and with one color warp and another color filling gives a pleasing effect. It is easily made and gives very little trouble.

"We have here a few samples of marquisettes. This first sample is made with Crompton motion and the other with a motion that the mill got out itself. It is rather fine sort of material, 14/16 denier silk both warp and filling. One should not attempt to make marquisettes unless he has both first-class weavers and fixers."

"I would like to ask Mr. Hays if that sample of marquisette he showed was made on a reed or on doups," requested a listener.

"The sample (silk) was made by inserting flat steel heddles through a reed and each heddle was tied to a leash of a Jacquard," answered Mr. Hays. "A regular gauze reed was used for the douping. This cloth was made for weaving patterns in silk similar to Madras curtains, hence the Jacquard."

A member of the audience brought up the much-discussed plans of Henry Ford to erect a mill, eliminating several important major processes. He asked: "Do you believe Henry Ford's new departure will be a world beater?"

"I do not know," replied Mr. Hays. "The statement I read said the mill will contain 7,600 spindles and approximately 200 looms. The cloth to be sateen weave 53 inches wide, 1.05 yards per pound, 13s warp and 9s filling. The raw cotton will go first to the bale breaker, then to two vertical openers set in tandem and then directly to the cards. The cards will deliver the stock directly to the back of the drawing frames and thence to the slubbers. Slubber, one process roving, spinning, spooling, warping, slashing and weaving. The production of cotton yarn is said to be approximately 29,000 pounds per week of 48 hours. It is proposed to run the mill three shifts of eight hours each per day.

"A sateen fabric made from the above specifications

(*Continued on page* 524.)

Halo and the Fleas

The Ninth Modern Fable

NOT BY AESOP.

On the topmost branch of the tree of tradition there sits a lonely, man-like figure. So high he sits, so solitary his position, we would naturally suppose it a post of honor, the highest rung on the social ladder, an impression that is changed as we draw near into a suspicion that it is a position of isolation, a vantage point of banishment.

He is not yet a man, only the general outline of one with the added indignity of a tail, and as we view him from the top of an adjacent tree we are inclined to wonder if he ever will be, for in comparison with the sublime being into which he may some day develop he seems unworthy, undignified—not yet having come to a realization of his own importance, or, in the absence of it, the necessity of imposing a pretended acknowledgement of it upon others—and, we are afraid, somewhat unhappy and his rather indefinite outline, seen only dimly through the mists of antiquity and the somewhat more tangible fog which arises in early mornings from the red and rambling Savannah, seems to waver in an unsettled, uncomfortable sort of way.

Perhaps it doesn't. Perhaps he is still snoozing away comfortably at the remnants of his beauty sleep or maybe he is shivering with the chill of early morning or—happy thought—probably he is scratching. Come to think of it, I am sure he is scratching, and as the mist clears away we see that it is to this that he owes his high position. He is, in fact, the most active scratcher in the neighborhood and as such is studiously avoided by his fellows. He puts in practically all of his time stirring up and hustling about a host of fleas that fill his fur and whiskers to such an extent that he looks bigger than he really is, but they don't seem to mind him very much, either as to what he does to them or as to what he says to them. They dig into his epidermis for bait, they play mumble-peg with his hairs, cowboy and Indians in the jungle on top of his head and loop the gap around the crook of his tail back onto the ridges of his backbone. And as the sun gradually comes up behind him we see where he got his name, for as the first bright beam of morning hits him in the back it surrounds him with a beautiful irridescent circle of changing color like a rainbow. Not a nimbus of sanctity—perish the thought. Not an aura of distinction, of superiority over his fellows; to the contrary. What we see is a luster of laziness, a radiance of inefficiency caused by numbers of his inhabitants who, being crowded out by their companions, let go, and in the act of jumping over to a better holding-on place, surround him with a living haze which refracts the light into prismatic colors—a rainbow halo of fleas!

Yes, this is Halo. I knew him well; a gentle soul in his adversity; a patient sufferer in his affliction. Too lazy to knock 'em off; too timid of the tiger that lurked in the bushes to get down on the ground and scrub 'em off in the dust; too impatient to pick 'em off one by one because there would be bound to be some left; too tender hearted to kill 'em anyway; the first, but not by any means the last, personification of lost motion he took it out in scraching while the fleas multiplied on him until they formed nations, had wars and exterminated each other and grew up again. Yes, I knew him. I was there. Aforetime we jointly infested the salubrious locality where now the popular lament as to the scarcity of bananas is frequently punctuated by a fervent minor wail of "Howcome y'all expect us to make good cloth out of this here ropy filling," accompanied at intervals by "Whereat's that there good yarn we was agoin' to get?" and when I say aforetime, I mean considerably afore the time the two water-logged argosies installed the ark-light on top of Mt. Arrarat or rammed the shore of Massachusetts hard enough to make the Plymouth rock. I was, in fact, one of his collaborators, but only to a minor degree.

We all had 'em in those days, but Halo, he kept 'em. Not that he wanted 'em particularly or was proud of his verminous pre-eminence. Not that he didn't work to get rid of 'em as hard as anybody, but his methods somehow failed to get results. As an agitator of personal populations he reigned supreme—and solitary—but as an exterminator he was a failure. He was forever swearing and scratching. He had days when he slew whole tribes of his tormentors and consigned them all to the bottom layer of damnation and there were other days—mostly—when he didn't experience a casualty. No matter what he did he never got rid of them all. There were always enough left for a fresh start. He never completed the job.

They gradually got ahead of him until he became a cuss word and a passing. To have as many fleas as Halo was the lowest depth of contumely. His family forsook him; his friends passed private emigration laws of their own and stayed away from him. The policeman snubbed him; the trash man high hatted him, and passing urchins showered him with shrill streams of invective. He was always going to have a clean-up week and step out once more into society, but he never did. Hence the high tree top. Then came convention week and Halo was elected.

Delegates and their families joyfully explored him and held excursions up and down his anatomy until late Friday evening when Halo decided enough was too much. He let out a hair-raising whoop and took a wild dive down through the branches. He hit the ground running, knocked an elephant over, trampled an innocent and unsuspecting turtle into a pulp and chased a visiting tiger clear out of breath. We cheered him on. We thought he meant it this time and would come back to us clean and pure, the little Halo we used to know so well and love, and placing his little hands in ours would raise his trusting eyes and say—but he didn't. About the time that tiger was run ragged he got a hunch that Halo wasn't after him at all, so he sat down and as Halo galloped past he calmly gobbled him down—Glub!—just like that. Something over four million lives lost at one gulp. Think of such a catastrophe and not a word about it in the history book.

Under the circumstances you would naturally think that was the end of him, but it wasn't. He's around here yet. I saw him the other day running the Spool Room at the Slacktwist Mill. When I asked for the overseer they told me to go up stairs and pick out the busiest man in the

room. When I saw him he was shoving boxes of yarn from one side of the room to the other so the sweepers could get to the floor where the boxes had been. He saw me before he got through and stopped to come down to the desk.

"All right," he said, biting off a large chew of plug, "what can I do for you? Talk fast, I ain't got much time." He hitched up his pants and jerked on his suspenders. His right suspender ended in a leather strap that was supposed to connect with two buttons, but one button was missing. He pulled the strap down until it was in place, fumbled for the button, and finding it gone, let the strap go. It flew up again and his pants slid down. The tobacco tag stuck between his teeth and he jerked it out and flung it on the desk. It bounced into the ink well and he stabbed it out with a pen and spattered ink on the desk in the process. Then he flung the pen at the pen rack and when it didn't land right he tried it again. It rolled on the floor and he picked it up and threw it point down so that it stuck up in the desk. Then he grabbed a sheet of blotting paper and mopped up the ink on the desk and flung the paper at the waste basket. He missed it the first two times, but made the hole in three, and by that time he was out of temper.

"I came up here to compare our speeds and costs with yours" I said. "I was talking to the Stiper and he said"—

"Oh, I ain't got any figures like that. I ain't got time for such foolishness. Hey, boy! Don't pour that yarn up there. Wait until I get through here and I'll show you what to do. I did start to take speeds here some time back, but never had time to get 'em all. It takes me all my time putting this yarn through here so I won't get behind. What's the office bunch good for if they can't keep up with such things? Maybe I can find the figures I had."

He pulled a lot of papers out of his desk, viewed them with disgust and shoved them back again. A negro boy came up and inquired, "Mister Henry say, is you got yo' report done yet?" and he began to swear. "No, I ain't had time, but I'll take time right now. Where is the dratted thing? Started it yesterday, but didn't get through. Here it is. Wait a minute; all I got to do is to add it up. Where is my pen? Every doggone time I lay anything down—oh, here it is, sticking right up in the desk. I wonder how that happened. I'm the unlucky guy. There's a good pen point ruined and me in a hurry."

He shuffled through the desk again and couldn't find another, so he said, "Well, I'll do it in pencil. Here you are. Nine and six is fifteen and ten and nine is thirty-three—forty-six—fifty-nine—and six is sixty-six. Here, take it and don't bother me any more; I'm busy. Now what was it you wanted? Speeds, wasn't it? All right, I'll go borrow a counter and get what you want. Wait until I come back."

I waited. I felt tired and sat down in his chair and landed out on one ear. One of the legs was broken, so I decided to wait standing up. Everybody else in the room sat down. In about half an hour he came back.

"Got down by the office and they claimed my report was added up wrong and I had to go over it again. It was wrong some, but it looks like they could have fixed it without worrying me. Hey, what are you all stopped for?"

"We're caught up," said the spoolers.

"Caught up?" he roared pulling up his pants and fumbing for his suspender button. "With all this yarn around here?" The button wasn't there so he let go again. I shuddered to think of the consequences if the other button gave way. "Hey, boy, what's the matter with you?"

"You said not to pour it up," said the boy.

"That's so, I did. I was going to check up on the weight of the baskets, but I ain't got time now. Go ahead and pour it up and make it snappy. We're behind now." He dropped into his chair and did a back somersault. When he got up he explained that the chair had been broken about a week and he hadn't had time to fix it. "But I'm going to some time. I'm going to take a week off and fix a few things around here. I think my speed's down some now on account of that belt being a little slack. I'd rather you come back next week when I get straightened out and I'll go over these things with you. I'm going to keep a record of all such things in the future. Think it's a good idea. Take 'em every so often and put 'em down. Tighten up all my belts and dress 'em. Don't look like I have any time to do anything at all. Here's a frame I got the boss to buy me to rewind tangled yarn. Nice, ain't it? Ain't had time to put it up yet."

He took off his glasses and polished them. One of the hooks that went back of his ears was broken and a piece of string that he had tied to it to wind around his ear snapped and he had to find another piece and tie it on, and while he was doing that two of his front teeth fell out and he explained that chewing tobacco sure was hard on false teeth and plaster of paris wouldn't stick 'em back on when they broke off. "But thay," he concluded, "you come back nexth week and I'll have you them figures. I'm tho busy now; I'm worried thilly. Thay, ain't I theen you thome plathe before?"

"I think so, but I doubt if you would remember it" I said and drifted back to the Super's office where I learned that the Super had accepted a better job and that Halo was going to take his place. "We're promoting him," said the Super, "because he's such a good hard worker. Always on the go and wide awake all the time. We think that he will make a good man."

I went off wondering whether all of his hard work wasn't merely a flea-halo. A couple of weeks later I went back. "Never did get you them figures," he said. "Ain't had time. Got a bigger job now; have to work harder. Come out here and see what I'm going to do. See this line of posts? Going to put up a pneumatic tube and blow cotton right from the mixing room to the dye house. Good idea, hey?"

"Sure," I said. "Are they working on it now?"

"No, I made 'em stop. Figured out an overhead track for handling beams in the slasher room. See here? Keep all the full section beams here and pick 'em up with a chain fall and roll 'em right to the slasher creel. They ain't finished yet. Made 'em knock off to fix an inspection table for the cloth room. Have a great idea there. Aim to take out a patent and make some money. They're working on that now—no they ain't. I told 'em to—what did I tell 'em to do?" He pulled up his pants; his glasses fell off and his teeth came out. As I left he shouted after me, "Have thith plathe in great thape thoon," and as I slipped through the gate and headed for home I said to myself, "Goodbye, Halo!"

It was the same old story. That job was a man-eater. For a while Halo had it bluffed, but when it found out he wasn't really after it, wasn't trying to run it; when it

discovered he was only scratching fleas and not chasing it at all, it calmly sat down and gobbled him up.

He's around here yet. Probably you have met him. He is the master mechanic who works over time repairing temporary jobs gone to pieces that should have been permanent jobs the first time; the carder and spinner who straighten up tangled work all day long and never have time to get their traverses fixed and the bobbins cleaned out; the weaver and superintendent who scratch up reed marks in the cloth room instead of straightening up the reeds on the looms. He is the man who scratches all day long at little things which, unimportant in themselves finally run him off the perch and out of sight because they are allowed to accumulate instead of being fixed. He is the good starter and poor ender.

The man who succeeded Halo made a success of the job and he didn't do very much more than finish up and put to work the ideas that Halo had begun on. But he finished them, and thereby proved himself the better man. I think the trouble with all of us Halos is that we lack the ability to stick with the job until it is finished. It is easy to start something new when the idea first hits us. It is difficult to stay with it persistently, doggedly, through Hell and high water until it is done. No matter how attractive or how easy it looked at first we all get to the ebb tide of enthusiasm when we feel like saying, "Oh, well, I never cared much about it. I know I can do it. You see I can do it. Everybody around here is satisfied I can do it all right. Let's quit, I've got something else I want to start on."

It has always seemed to me that the story of the Tower of Babel is an ancient allegory on this very human trait. I have always thought of the Monday morning when the thousands of workmen reported for work, and viewing the enormous structure already put up and the tons and tons of material still to go, were informed that the work had been abandoned. No wonder everything was thrown into confusion and they had to invent new languages to be able to say all they thought of it!

That's why I always finish up everything I start on before I take up anything else. (Note to the editor. Hey, Ed, finish this for me. I ain't got time. I've got to go and tell the frame hands on the four hank to quit using red chalk and substitute green. We're out of red and I ain't had time to order any more. When I get through that I've got a new idea for another fable and I want to work on that).

It is reported that the Franklin Process Company, with main office and machine shop at Providence, R. I., have recently received through the Universal Winding Co., foreign selling agents, a large export order from India for Franklin dyeing machines. The Universal Winding Company also reports that it obtained orders for complete Universal winding machine equipment to be used in conjunction with the Franklin dyeing machines.

A very novel brochure has just been issued by The Fulton Company, Knoxville, Tenn., in the form of a two-act play, entitled, "Sam Sylphon, A Flexible Fellow." It is entertaining and is designed to tell of the use of the Sylphon bellows made by this company, which also manufactures temperature and damper regulators, air and reducing valves.

J. D. Massey.

J. D. Massey, vice president of the Eagle & Phenix Mills, Columbus, Ga., died suddenly at his Columbus home on Friday, February 8th, following a short illness, his death coming as a distinct shock to his intimate friends.

The active head of one of the South's foremost mill organizations, Mr. Massey's position was one of importance, and his death brings a vacancy in southern textile business circles that will be a great loss to the industry.

Mr. Massey was born in Oconee county, South Carolina, on December 11, 1873. He made his way through a commercial college and in 1884 was elected secretary of the state railway commission of Georgia. After about ten years he was elected treasurer of the Eagle & Phoenix Mills, and in 1916 became vice-president of this organization.

Chief among the characteristics for which Mr. Massey was known and loved by his friends and business acquaintances was an originality in views and in expression. Shortly before his death, he prepared for the American School Board Journal, of Milwaukee, Wisconsin, an autobiography, which gives a keen insight into his characteristics. In that thought, and in the belief that his many intimate friends who read COTTON will appreciate this typically original story of his life and characteristics, this autobiography by Mr. Massey is reproduced herewith:

"I was born so far back in the past that the hair on top of my head is very scarce. Am a native of Oconee county, South Carolina. Was reared back in the woods among the mountains and did not know what a railway locomotive was until I was quite a sizeable boy.

"Ancestry, Scotch-Irish Presbyterians, who ate cold food on Sunday, and believed in hard work, economy and self-reliance. Received what little school education was in the country schools of the neighborhood.

"As soon as big enough to 'escape,' left those surround-

ings and went to Atlanta, Georgia. There studied stenography and typewriting. Thereafter threatended medicine, but did not like the idea of day, night and Sunday uncertainties and irregularities in the way of practice. Then threatened law, but upon observing that it was a contentious profession wherein rascals had to be defended with the same ardor as if they were saints, abandoned the idea.

"Then found a position with the state railroad commission of Georgia. The position of secretary of that body becoming vacant, was elected secretary when just past twenty-one years of age. After holding that position for about ten years, was offered the position of treasurer of the Eagle and Phoenix Mills, a cotton manufacturing corporation of Columbus, Georgia, and accepted because it paid more money. Held that position twelve years and then became vice-president of the same corporation, and now hold that position. Hold sundry other positions that do not amount to much, such as being director in various corporations.

"Never wanted any free jobs, but have had a number of them, such as president of board of trade, of social clubs, and the like. One of these free jobs that I could not shake off was a member of the school board for sixteen years and president for about one year. Never made any decided effort to get rid of the school board work, for education is about the most civilizing influence in the world, and is, therefore, sadly needed by every human being, so that viewed simply from a standpoint of public safety, if nothing else, it is a matter that cannot have too much attention and encouragement.

"Am a member of no lodges, secret orders, nor Civitans, nor Lions, nor Kiwanians, nor Rotarians, and never was, and don't want to be. Like to devote spare time to things that appeal to me, instead of being dragged around as a part of sundry organizations, doing things that I don't care for.

"As to hunting, shot a snowbird once when aged about eight years, and quit. As to fishing, caught a minnow with a bent pin, the summer following, and then laid off from fishing. 'Thrashed' around a golf field twice and gave it up.

"Took dancing lessons from a fat lady teacher once during a hot summer, and backed out of that amusement. Never did own an automobile, and, bless the Lord, never want to. Was asked to play poker once, but decided that a dollar in the jeans was worth more to me than it would be in the other fellow's jeans, and hence declined.

"Net result—have absolutely no taste whatever for so-called 'sports,' games and amusements, and yet, strange to say, am just as happy as a king. Just naturally like to walk and take athletic exercises regularly, not especially for health and strength, but because they are agreeable. Am fond of 'night life' in the shape of crawling under the covers not later than ten o'clock and sleeping a full eight hours. Have plenty of so-called 'habits' most of which are pleasant; in fact, have observed that a bad habit is what one does not want to do himself.

"Have a natural love for books and especially those dealing with history, travel, foreign languages and antiquity, and have spent more money on books than a person of Scotch-Irish extraction would be expected to spend on anything—which goes to prove that people spend money for what they want, and are 'close' when they really are not interested.

"Am not a sentimentalist and am not chicken-hearted about 'hardships,' because I have never observed any harm that hardships and hard work did anybody. On the contrary, I believe that most of the so-called 'social problems' are due to the lack of hard work. Readily concede that immediate and acute distress should be relieved, but mainly that people should be taught by our educational systems how to make a living, and then either to be made to earn a living or be put in jail.

"Also think that the so-called 'charity' simply varnishes over at public expense a great deal of physical deficiency that could be and should be remedied, thereby rendering potential beggars and jail-birds useful citizens. For instance, many are accused of being shiftless who merely have hook-worm. Others naturally become morons because they are clogged up with adenoids. Others are always feeble because they have diseased tonsils and things of that sort. Still others are considered half foolish because they have poor eyesight that needs attention. Others are pitiful objects because, although having plenty of good food, it is made barbarously unpalatable and indigestible by the alleged cooking that it receives.

"Hence my belief that the sentimentalists and the uplifters are merely exhausting their emotions and pawing the air in vain instead of getting at the causes of these things and preventing and eliminating them.

"Never succeeded in catching a wife. Perhaps was always a little too close with money matters to dazzle with the fair ones. However, have thought of advertising in the papers to see if there is as big a crank of the lady persuasion who might 'join up' to see whether two could live as cheaply as one."

That was Massey.

Quiet, self-contained and thoughtful, he was always making plausible excuses for the other fellow's weaknesses, while he searched around to discover causes for those weaknesses that could be cured by education, by medical attention, or by some other method known to man.

It is quite probable that of all the cotton manufacturers of Georgia, there is none better beloved or less understood than this same quaint character who has passed to the great beyond, but whose oddly expressed opinions and humane actions will live for years to come in the memories of his intimate friends and associates.

Proctor & Schwartz, Inc., 7th Street & Tabor Road, Philadelphia, have just issued Bulletin 81, illustrating and describing the "Smith-Furbush" line of felting machinery. As is known, the Smith-Furbush Division of Proctor & Schwartz, Inc., is the same organization of felting, carding, preparatory and waste machinery specialists formerly known as the Smith & Furbush Machine Company. This new catalog introduces the standard "Smith-Furbush" machines of various kinds for the manufacture of batts or felts of every description, and is also to serve to give a general idea of the uses, appearance and construction of these machines.

A new circular on the Logemann hand, belt, electric and hydraulic baling presses has been issued by Logemann Brothers Co., Milwaukee, Wisconsin, and is available upon request.

R. C. Freeman.

Robert C. Freeman, president of The Dixie Cotton Mills of LaGrange, Ga., and head of the cotton department of the West Point Manufacturing Company, died at eight o'clock on Saturday evening, February 23rd, at a santitarium in Atlanta, Ga.

In his death, the textile industry of the South lost one of its popular men, one of its business leaders, an important factor in the fabric of the industry in this section. His intimate friends lost a charming personality, a delightful companion and a true, steadfast associate. His influence for the encouragement of business integrity, accuracy and honesty will continue to be felt, however, through those whose contacts gave them the opportunity of association with him during his years of service in the industry.

Robert Clarke Freeman was born in October, 1861, in Greenville, Merriweather County, Georgia, the son of R. A. S. Freeman and Hattie R. Ellis Freeman. He attended school at Greenville, and, acquiring the spirit of industry at an early age, worked after school hours and Saturdays in a store in the town.

About 1876 or 1877, young Freeman went to West Point, Ga., where he accepted employment at the book and stationary store of M. Herzberg, beginning a business career in the town which was later to prove his life residence and where he was to become a leader of the textile industry which was at that time in its inception in that section.

After residing for some several years in West Point, Freeman went to Atlanta, Ga., where he accepted a position in the bookkeeping department of Freeman and Crankshaw, a jewelry concern there. He remained in Atlanta for a period of about six years, but West Point apparently had presented itself as containing possibilities for him, and so he returned to the little town by the Chattahoochee.

It was at that time he became first associated with the work which was to prove his life vocation and in which he was to demonstrate his business acumen and sagacity. Taking a position in the office of Harrington Brothers, cotton merchants of West Point, he found opportunity for expression of his inherent abilities and natural inclination.

After he had been with this concern for several years, Mr. Freeman's business ability became apparent, and he was later placed in charge of the cotton department of the West Point Manufacturing Company. This position he retained until the time of his death, having greatly development this department during the thirty or so years he was in charge.

It was in connection with this work that Mr. Freeman very effectively demonstrated his ability at business organization and the development of an efficient system of management.

When he first assumed charge of the company's cotton department, the organization was itself in its beginning. As the properities of the company were expanded there came a resultant increased demand for more raw staple for consumption. Mr. Freeman here exhibited an unusual ability at organization, and developed his own purchasing and examining department in a manner which kept pace with the tremendous development of the manufacturing plants.

It was a recognized fact in the trade that Mr. Freeman's cotton organization was one of the most complete and efficient in the entire industry.

He was known as one of the leading cotton buyers in the industry, it being a report that he purchased approximately ten to fifteen per cent of the entire southern cotton crop annually. For many years he had charge of the cotton for all of the Wellington, Sears interests in his section, which included the five plants of the West Point Manufacturing Company, The Dixie Cotton Mills at LaGrange, and the Anchor Duck Mills at Rome, Ga., following its acquisition by his company several years ago.

Some twelve years before the death of Mr. Freeman, the Wellington, Sears interests began casting about for a suitable man as president of The Dixie Cotton Mills, at LaGrange, Ga., one of their southern holdings. Because of

his demonstrated ability in perfecting efficient operating organizations, his penchant for accuracy, completeness and thoroughness in his sub-officials, Mr. Freeman was selected for the place.

Here again the man's inherent demand for accuracy asserted itself forcibly. His own headquarters in another city, it was necessary for him to leave most of the details of operating the mill to his local management. His executives in that mill recall the forceful manner in which he impressed upon them the actual necessity of being correct, of making accurate reports and of making them promptly, of carrying a job out to its consummation with thoroughness and careful attention. He executed his own work in this manner, and expected it of those associated with him.

Strict adherence to the highest business principles was another prominent characteristic of Mr. Freeman's dealings with those meeting him in business relationship. He was ever ready to meet his fellows in all sincere, honest and fair business ethics—and he required that his fellows meet him in just that way, too. He asked that, and no more. A prominent cotton factor who had been doing business with Mr. Freeman for a score of years says frequently that in all of his business relationships he had

never met a more honest, straightforward business man.

An an individual Mr. Freeman was one of the most sociable of men, ever courteous and chivalrous. He loved men and enjoyed to the utmost his associations with them. He enjoyed an acquaintanceship and popularity universal among his fellow executives in the industry, and at their gatherings, always participated helpfully and earnestly in the subjects of business, and was as ready for participation in the social features of the meetings.

And yet with it all he was of a most unassuming nature, insofar as his own personal prominence and exploitation were concerned.

If he had a hobby, as that term is applied now-a-days, it was in helping others. Possibly this trait has not been announced up to this chronicle that is written after his passing—but those most intimate with him know of the many times he helped a fellowman who was in distress, physically. He had almost a passion for helping in the way of being instrumental in restoring stricken ones to health and happiness. The individual stories of this assistance on his part may never be told—perhaps it is better so—but his helpfulness in this respect is the cause for personal gratitude on the part of many who will read of his passing with the sense of having lost a real true friend.

And his spirit of helpfulness evidenced itself as well in business circles. There are prominent men today who owe their successes in large part to the straightforward teachings in the high moral ethics of the business principles of Mr. Freeman.

Those are the things that count—"the good that men do lives after them"—and so Bob Freeman's influence for good will continue to have its effect in making men adhere to the right even though he himself is removed from among them.

Mr. Freeman was married, in October, 1905, to Miss Gillian Lanier, daughter of Mrs. Ada Lanier and sister of George H. Lanier. His wife's death, however, preceded his own by several years, and one daughter, Miss Gabriella Lanier Freeman, survived him at the time of his passing. Other relatives surviving are: a sister, Mrs. J. S. Horsley, Jr., of West Point; four brothers, Myron E. and E. B. Freeman, of Atlanta, Ga; W. S. Freeman, treasurer and general manager of the Opelika Mfg. Co., Opelika, Ala.; and Pope W. Freeman, of West Point, Ga.; and two aunts, Mrs. Willie E. Adair and Miss Arvilla Ellis, of Greenville, Ga.

In addition to the business affiliations mentioned, Mr. Freeman was one of the founders and vice-presidents of the Citizens' Bank of West Point, a charter member of the West Point Rotary Club, a member of the West Point Country Club, and a member of the First Christian Church of West Point.

The funeral services were conducted on Monday, February 25, from Mr. Freeman's West Point residence, with interment in Pinewood Cemetery at West Point.

What the Southern Mills Are Doing

As Robin Redbreast emits his trill and warble to herald Springtime, the southern textile industry, almost as a unit, recognizes his song as the harbinger of the annual convention season.

Presidents and treasurers, superintendents and overseers, all, begin to hunt up the Gladstone and the handbag in preparation for the pilgrimage to the conventions of their respective associations.

In chronological order, the coming events of the summer follow:

Textile Operating Executives of Georgia, Cecil Hotel, Atlanta, Ga., on Tuesday, March 18th.

Knitting Arts Exhibition, Commercial Museum, Philadelphia, April 7th to 11th, inclusive.

National Association of Hosiery & Underwear Manufacturers, annual convention, Bellevue-Stratford Hotel, Philadelphia, April 8th and 9th.

National Association of Cotton Manufacturers, spring meeting, Copley-Plaza Hotel, Boston, April 30th and May 1st.

American Cotton Manufacturers' Association, annual convention, Hotel Traymore, Atlantic City, N. J., May 27th and 28th.

Cotton Manufacturers' Association of North Carolina, annual meeting, Blowing Rock, N. C., latter part of June.

Southern Textile Association, annual meeting, Mayview Park Hotel, Blowing Rock, N. C., Friday and Saturday, June 13th and 14th.

Which presents sort of a full program for those who attend 'em all—but a most enjoyable and profitable one, on account of the pleasurable associations and helpful sessions that these conventions provide.

Turning to the announcements of new construction and other items of interest that came to light during the past month—

The period did not disclose many items of striking importance in this connection. Enlargement plans and expansion programs seemed for the most part to remain either in committee or deferred until better business prospects present themselves.

There were several items indicating enlargements and developments, however—

One report stated that the Tallassee Mills, at Tallassee, Ala., are having plans drawn by J. E. Sirrine & Company for an addition to their present mill to accommodate 30,000 additional spindles.

The Liberty Cotton Mills, Clayton, N. C., are installing 5,000 additional spindles and will erect several new houses in the village.

Additional spinning and carding machinery is being put in at the Laurens Cotton Mills, Laurens, S. C., and some 18 houses for employees are being built.

Contract for the erection of the three-story weave mill planned by the Lancaster Cotton Mills, at Lancaster, S. C., has been awarded to Potter & Shackleford, of Greenville. The building will be 104 x 108 feet, to cost approximately $70,000.

The Tanner interests have procured the stock formerly

owned by J. H. Mayes, and Ira C. Triplett, of Charlotte, and B. J. Dobbins, of Gastonia, in the Grace Cotton Mills at Rutherfordton, N. C. K. S. Tanner has been elected president, W. A. Harrill, secretary; A. W. Young, superintendent, and R. R. Flack, assistant secretary and treasurer.

The plant of the Echota Mills at Rome, Ga., has been purchased by the Strain Manufacturing Company, which is composed of J. A. Strain, of Calhoun, and his brother, G. L. Strain, and three sons, A. S., W. J., and Dan T. Strain. J. A Strain was formerly president of the Echota Mills, but announces that he has disposed of his interests in that concern and with his partners will operate the Rome plant under the new name. The mill has 5,000 spindles and 132 looms manufacturing principally duck.

The Knoxville Spinning Mills, at Knoxville, Tennessee, one of the properties of General L. D. Tyson, has been purchased by the Appalachian Mills, which gives the latter concern a total of 40,000 spindles.

Western Reserve Cotton Mills Georgia Company, at Millen, Ga., has resumed operations after being closed down for a considerable period. The main southern office of the company is located at Quitman.

The plant of the Cherokee Falls Mfg. Co., at Cherokee Falls, S. C., has been consolidated with the Henrietta Mills of Caroleen, N. C., and is now known as Henrietta Mills, Cherokee Falls Plant. It is equipped with 30,732 ring spindles.

Operations are expected to begin in the early spring at the new Wade Mfg. Company's plant at Wadesboro, N. C.

J. E. Sirrine & Company, Engineers, Greenville, S. C., are preparing plans for enlarging the plant of The Seneca Company. Plans call, in part, for a weave shed to house an initial installation of 1,000 looms, 500 of which will be taken out of the existing main mill building and 500 will be moved from one of the Lonsdale Company's Rhode Island mills. The Seneca plant was purchased last year from the Victor-Monaghan Company by the Goddard interests with plants at Lonsdale, R. I.

Contract has been let to the Henry Construction Company, of Greenville, S. C., for the installation of a sewage system in the village of the Piedmont Manufacturing Company, Piedmont, S. C.

Operations at the new plant of the Cascade Mills, Mooresville, N. C., will begin about April 1st, it is reported. The equipment will consists of 12,000 spindles and 300 looms.

The Purdue Spinning Company, Gastonia, N. C., has been formed as a holding company which has leased the Cardinal Mills, of West Point, Miss. The office of the company will be maintained at Gastonia. This mill was formerly leased by E. T. Switzer, of the Cotton Products Company.

The Russeony Mill, Alexander City, Ala., has completed its new mill buildings and installed the equipment of 2,448 spindles for making 14s single yarn.

Forty operatives' houses will be added to the village of the Tucapau Mills, at Tucapau, S. C., it is reported. Lockwood, Greene & Co. are the engineers.

Out of the West continue to come statements of vigorous efforts for the location and construction of mills in Texas and other states. Among these reports are:

One to the effect that proposals have gone out for the building contracts for the plant of the Elpaso Cotton Mills, at El Paso, Texas. It is expected to have the plant in operation by October 1st, producing denims, osnaburgs, chambrays and drills. A. P. Coles is president and J. P. Henderson vice-president.

Omaha, Texas, is making a start toward a new mill, a company is soon to be organized for this purpose, with a capital of $400,000, by Milton Farrier as president, and John R. Wheeler, of Texarkana, as vice-president.

The Kincaid Manufacturing Company, at Griffin, Ga., has been purchased by the Georgia Cotton Mills, of Griffin, it is reported, and the combine will be known as the Georgia-Kincaid Mfg. Co. John H. Cheatham, who has been president of the Georgia Cotton Mills, will be president of the new organization, with W. W. Norman, secretary. Woodward, Baldwin & Company will be the selling agents.

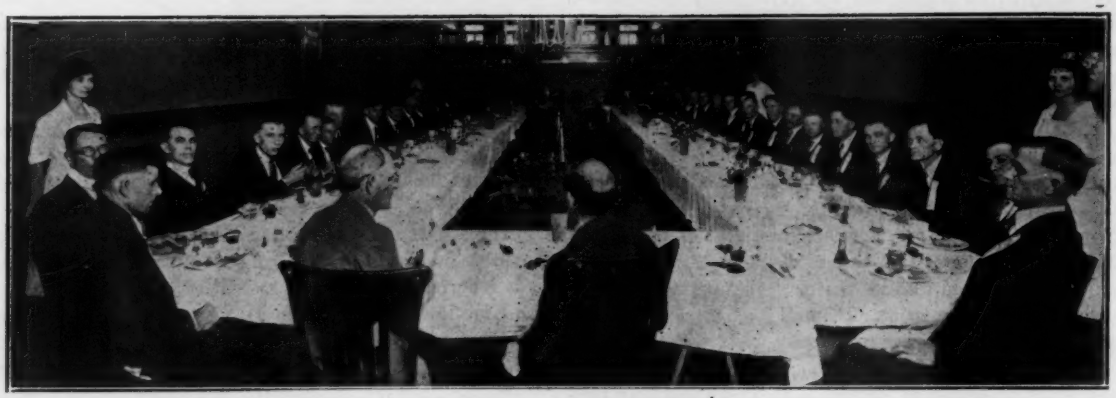
The Industrial Club of the Newberry Cotton Mills, Newberry, S. C., held its first meeting recently, and the occasion was very enjoyable. About 65 members were present. Addresses were delivered by Z. F. Wright, president of the mill, and by J. M. Davis, superintendent of the mill. The election of officers resulted as follows: W. H. Hardeman, president; F. K. Jones, vice-president, and H. G. Alewine, secretary. The inauguration address was made by W. H. Hardeman.

The New England Mill Situation.

Hearings have been going on recently before a committee of the Massachusetts legislature for the purpose of determining whether proposed legislation shall be recommended on the 48-hour law now on the statute books of the state. The petitioners are manufacturers who seek, first a repeal of the 48-hour law and a restoration of 54 hours, or in the event of that not being possible, to permit the rearrangement of work whereby mills will be enabled to employ two shifts of operatives each day and thus approximate the longer work week permitted in other states. In Rhode Island, the 48-hour law is still being pushed in the legislature but the Senate of that state is believed to be opposed to the legislation. It probably will not pass. In both states, arguments have been advanced to show that of recent years all additions to cotton mill equipment in this country have been made in other sections, notably in the South.

There is not much to indicate that there is likely to be any change in Massachusetts. After the experience of recent years, popular opinion is less eager to further short hour legislation, but it cannot be truthfully said that there is any strong opinion favoring a return to the longer hour system. There is more or less talk of trying to further national short hour legislation but it has gone no further than talk, in so far as anything is now in sight to show that a united request will come out of New England for short hours elsewhere. In New Hampshire, the labor unions and the democratic politicians are still talking of forcing that State to accept a 48-hour law patterned after the one in Massachusetts, but it is extremely doubtful if the next fight in the legislature will be any more successful than the last. In Maine, the question has been settled against a 48-hour law by a referendum vote and will not come up again very soon.

It would seem as if operatives might be led to comprehend the folly of crippling Massachusetts mills with a



Photograph of the Banquet Given at the regular semi-annual convention of the Texas Textile Association, held in Sherman, Texas, some time ago. Dan Poole is a leading spirit in this organization.

48-hour law that affects a third or more of the cotton spindles in the country. But, although Fall River mills are running hardly 40 per cent of capacity, and mills in other parts of the state are operating on a three or four-day-week schedule, there appears to be an utter indifference on the part of workers. Some of their leaders are contending that if the mills could run 54 hours a week now it would not make business any better, and similar fruitless arguments are heard in other places.

There is certainly no great interest manifested by business men in other lines than cotton goods to endeavor to bring about a change in the short hour law of the state. Chambers of Commerce and other business organizations are not taking part in the present demands presented to the legislature by representatives of the cotton manufacturers' association. There is no public sentiment among lawyers, doctors, clergymen, or other leaders of thought outside of the textile industry, that is being strongly presented in an effort to stop the hobbling of industry in this particular state. The manufacturers are fighting their case alone. Even the stockholders in the corporations have never manifested any united opposition to short hour legislation.

The cotton goods mills of the State have not been facing such a difficult year since the late '90s as the one now confronting them. Curtailment of production has reached a point where it is exceptional to find mills running to capacity. There are still a great many mills that are running full time but many of them have parts of their machinery idle. In Fall River whole plants are shut down and have been closed for weeks. The print cloth mills of the American Printing Company, more than 500,000 spindles in all, have not been operated since December. The Stafford mills of 115,000 spindles are idle. The Flint mills, has one plant of 40,000 spindles idle. And there are some others stopped.

An estimate made a few days ago at Fall River showed that only about 25 per cent of the print cloth yarn goods mill capacity is fully employed. Of the whole 4,000,000 spindles in the city, it is estimated that not more than 1,500,000 are running full time. Yet stocks of goods in that city are not at all large. It is thought very doubtful if more than a million pieces of goods of all kinds are held in warehouse, unsold, at Fall River. There were times not many years ago when stocks of over 5,000,000 pieces were carried. There are several mills in the city that are engaged on combed goods or fancy goods that are running regularly.

The effect of the prolonged curtailment is best shown by the decreasing dividends. A week or more ago an estimate showed that the quarterly dividends for the first quarter of the year on a capitalization of $43,000,000 averaged only 1.514 per cent, the smallest in over seven years. The Seaconnet mills have become financially crippled and will be taken care of by a committee of creditors. There have been several changes in management. A month ago the stockholders of the Tecumseh mills voted to sell out to the stockholders of the Davol mills, the plants adjoining each other, and other consolidations are in progress.

In New Bedford, the center of the fine cotton goods industry, operations are estimated to amount now to about 80 per cent of capacity, but business has been slackening since the first of the year and further curtailment there is looked for. In Rhode Island three or four mills of B. B. & R. Knight, Inc., are closed. In the western part of Massachusetts, and some parts of Connecticut several mills have recently gone onto a short time schedule of three or four days a week. While some mills that are shutting down have cotton in hand, their managers feel that it is following the wrong policy to make the raw material into cloths that cannot be sold now at cost, or even approximating cost based on cotton values below those now current.

Concerning the general cotton goods situation and outlook, the New England manufacturers as a whole believe that there can be little relief from the present uncertainty until a new cotton crop is ready to be picked. They believe that there is no reason to expect that the country will consume a full product of cotton on a basis of cotton price above 30 cents a pound. They still believe that all the cotton grown will be marketed but so long as consumers and merchandisers pursue their present tactics of buying only when they actually must have goods, the burden of losses will be thrown on the producers.

Experienced New England manufacturers are convinced that cotton manufacturers as a whole will not curtail production sufficiently to bring about a market improvement from the scarcity of goods this spring. That is one reason why many of them in charge of mills having good reserves, prefer to contract their output, and to stop looms just as fast as orders expire and no profitable orders come to take their place. The course of the markets recently have shown that goods are being produced in this country far in excess of the consuming demand for them. They point to the downward course of prices, and the frequent sales of cloths below any possible cost of profitable production.

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TRUSCON STEEL WINDOWS

An excess of supply and a pressure to sell accounts for these low priced sales.

Competition for business is growing harder each month. This week the Amoskeag Company named prices for ginghams for Fall on a basis of value 2 cents a yard lower than Spring prices when cotton was at least 5 cents a pound cheaper than it is today. The company needs business and in addition to making a low price, it has brought out the best lines of styles in its history. Many of the new patterns shown will cost from ½ to 1 cent a yard more to weave than ordinary plain checks cost, yet they are offered very low to induce buyers to place advance mill orders.

But what is true of ginghams is also true of many other goods. In the New York market, denims were offered at 24½ cents for 2.20s, a basis of about 54 cents a pound, when cotton was over 32 cents. This price is so low that the few denim mills left in New England, and which have much lower costs than is commonly supposed, will not accept business on that level.

The mills making napped goods have not sold more than half their possible output for the fall season. The wide goods have sold better than the narrow goods, and the plain fabrics have sold rather better than the fancies, thus far. This is in direct contrast with other lines of cotton goods, the common experience in New England being that the fancies are the good selling cloths while the plain goods are very slow.

The finishing plants continue to operate on greatly reduced schedules. The job printers are not running more than half capacity. The dyers and bleachers are doing a little better than that total but their orders ahead are not large enough to carry them more than a week or two, the policy of converters being to order only when goods are actually required.

Recently the wide sheeting, sheet, and pillow tubing plants, have begun to lack orders. The advances in price made a short time ago have not been sustained by the trade. Where buyers pay the top prices they order only in case lots. They are anticipating a revision of prices downward.

The mill machinery shops are now running on short time in nearly every instance. There are some of them that have orders in hand but they are not being pressed to complete them. It is perhaps as good a barometer as any showing that the cotton industry is going through hard times.

Cotton Comment.

BY H. AND B. BEER.

New Orleans, February 16th, 1924.

The unfavorable domestic textile trade conditions, referred to in our previous review, show no change for the better, and there has been no revival in the demand for spot cotton in the South, while trade reports from England are less favorable.

BRITISH BOARD OF TRADE REPORT FOR JANUARY.

	This Year	Last Year
Exports of yarn, pounds.....	11,000,000	12,800,000
Exports of cloth, yards 354,000,000		400,000,000

As a result of the dullness in the spot department and in the cotton goods division, in conjunction with the continuance of liberal receipts at the ports, stocks have been decreasing slower than last year, due to small takings by domestic mills, permitting the world's visible supply of American cotton to gradually increase relatively, week by week, compared with last year, until today it is a little larger than at this time last year, whereas at the opening of this season it was 1,073,000 bales smaller than at the opening of last season.

This has been made possible by this season's crop being somewhat larger than last season's, and by the falling off in spinners takings, which, since August 1st, total only 7,422,000 vs. 8,342,000 last year, or nearly one million bales smaller than one year ago, of which falling off northern and Canadian mills are credited with 559,000, southern mills 227,000 and foreign mills 134,000, as will be noted by the following comparatives:

SPINNERS TAKINGS SINCE AUGUST 1ST.

Bales	This Season	Last Season
North and Canada	1,278,000	1,837,000
Southern mills	2,960,000	3,187,000
Foreign mills	3,184,000	3,318,000
Total to date	7,422,000	8,342,000

WORLD'S VISIBLE SUPPLY OF AMERICAN COTTON.

February 15th	This Year	Last Year
American	2,817,000	2,811,000
Other kinds	1,630,000	1,723,000
Total of all kinds	4,447,000	4,534,000

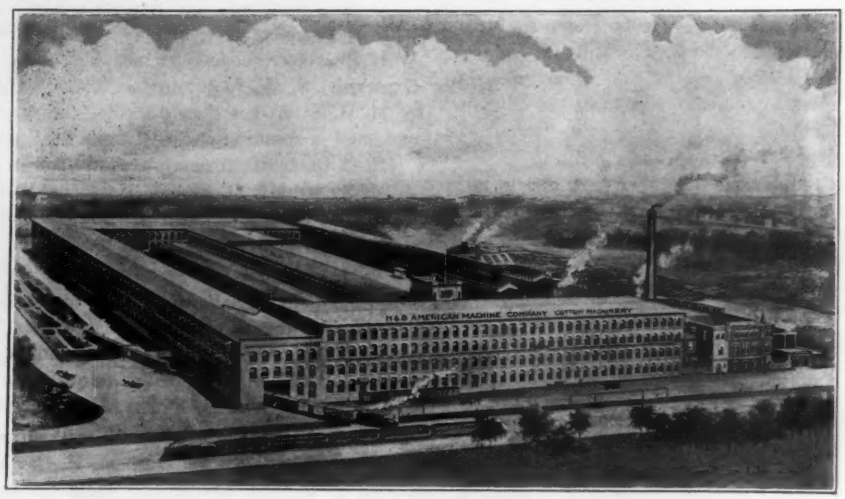
The fact that the world's visible supply of American cotton today is slightly larger than it was last year when the market was nearly three cents lower than it is today, removes the recent surface bullish features of the statistical position, and as the demand for raw cotton and the finished product is not satisfactory at home or abroad, fundamentals, naturally, are not as strong as they were in the recent past.

Never the less, it is realized that the South has 660,000 bales less to market than it had at this time one year ago, and it is known that American mill stocks on January 31st were 355,000 smaller than on corresponding date last year. Consequently there is an apparent shortage in the invisible supply of fully one million bales compared with last year, without taking into consideration the probability of European mills having less stock than one year ago.

These conditions will likely assert their influence in time to come, but are without effect just now. In event of the demand for spots or goods improving, which is not at all unlikely since prices are now about six cents per pound, or about $30 per bale, lower than the "peak" of the season, the market could easily make a bullish demonstration of importance.

Aside from the depression in the textile trade, business in general in the United States is satisfactory, with a promise of expanding, which is indicated by the revival in the demand for metals, especially for iron and steel. Furthermore, the Federal government is making every effort to keep the wheels of commerce and industry active by assisting farmers of the West, thereby increasing their purchasing power. Moreover there is an abundance of funds at low interest rates, with the probability of still lower rates in the future.

COTTON MACHINERY



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Notes About Men You Know.

GENERAL LAWRENCE D. TYSON, past president of the American Cotton Manufacturers' Association, is a candidate for the Democratic nomination for United States Senator from Tennessee. General Tyson recently disposed of his textile holdings, it was reported.

IRVING SOUTHWORTH has been appointed agent of the Pacific Mills to succeed Walter E. Parker, who now becomes agent emeritus in recognition of his many years of valuable service to the company, it has been announced.

Mr. Parker first went to the Pacific Mills at Lawrence in April, 1881, and took charge of the cotton mills. In 1887 he became agent of the cotton and worsted mills and in 1892 of the whole plant, including the print works. The success and development of the Pacific Mills through all these years up to the present time have been due in large measure to Mr. Parker's untiring efforts and unusual ability, the company's announcement states.

Mr. Southworth first went to the Pacific Mills in June, 1910, as superintendent of the cotton department at Lawrence. In 1914 he assumed charge of the Cocheco Department at Dover, N. H., and in June, 1916, became agent of the newly acquired Hampton Mills Department at Columbia, S. C. His successful handling of each of these positions led to his appointment on March 1, 1920, as assistant agent in active charge of operations at all Pacific Mills, including the Hampton Department. As agent, his responsibilities will include all plants of Pacific Mills, not only at Lawrence, Dover, and Columbia, but also the new plants being erected at Lyman, S. C.

GEORGE H. LANIER, of West Point, Ga., has been elected a director of the Fourth National Bank of Atlanta. Mr. Lanier is vice-president and general manager of the West Point Manufacturing Company, and is in charge of the Wellington-Sears interests of Alabama and Georgia, and is one of the leading textile executives of the South. His election is especially interesting because he is the only out-of-town director of this large institution.

S. A. MOAK, who for fifteen years has been connected with the Anchor Duck Mills, and has been overseer of weaving, has been made assistant superintendent under Superintendent John S. Bachman.

T. D. PICKELL has resigned as superintendent of the Knox Hosiery Mills, Cleveland, Tennessee, and become connected with the Cumberland Hosiery Mills, Nashville, Tennessee.

J. T. TIDWELL has resigned as superintendent of the Judson Mills, Greenville, S. C.

T. B. RECTOR, who has been overseer of the cloth room at the Peerless Cotton Mills, Thomaston, Ga., has resigned and returned to Greer, S. C.

S. C. SIMMONS, who has resigned as active vice-president of the Cannon Manufacturing Company, at Kannapolis and Concord, N. C., has become connected with the Hunter Manufacturing & Commission Co.

A. FERGUSON MACINTYRE, who recently resigned as agent of the Fulton Bag & Cotton Mills, Atlanta, Ga., has become general manager of the mill properties of J. W. Sanders, which include eight plants in Mississippi and Alabama.

C. T. HUGHES has become superintendent of the Glenn-Lowry Manufacturing Company, Whitmire, S. C.

LAWRENCE R. BRUMBY has been made assistant general superintendent of the Osprey and Porterdale Mills of the Bibb Mfg. Company, at Porterdale, Ga. He was formerly assistant superintendent at the Osprey Mill No. 1.

D. C. JONES, who has been with Alexander & Garsed, southern representatives of the Crompton & Knowles Loom Works, has been made superintendent of the Judson Mills, Greenville, S. C., succeeding J. T. Tidwell, resigned.

M. D. SAULS has been promoted to the position of second hand in spinning at the Olympia Mills, Columbia, S. C.

E. C. GOODWIN, formerly second hand in carding at the A. M. Smyre Mfg. Company, Gastonia, N. C., has become overseer of carding at the Flint Mfg. Company No. 2 Mill, Gastonia, N. C.

J. H. CHAPLIN, vice-president and director of sales of The Root Company, Bristol, Conn., has sailed for England to look after the details of some large installations of Root automatic counters for some of England's most prominent textile mills. While in England he will make a close study of the particular methods used in that country.

JAMES WARD has been made general manager of the Morven Cotton Mills, at Durham, N. C. Mr. Ward is a native of Ireland, having had about 24 years experience in the mills of that country, being for three years general manager of the Bann-view Factory at Porterdown, and previously having been connected with the Brookfield Factory for 14 years, in the successive positions of fixer, overseer and superintendent.

C. M. TURNER has resigned as president of the Newport Chemical Works, Inc., to assume the duties of director of sales at the National Enameling and Stamping Company, a nationally-known institution. Mr. Turner has been associated with the Schlesinger interests in various capacities for fifteen years, so that severance of his relations is keenly felt by his former associates. The business of the Newport Chemical Works, Inc., will be carried on as heretofore under the direction of Dr. E. H. Killheffer, vice-president.

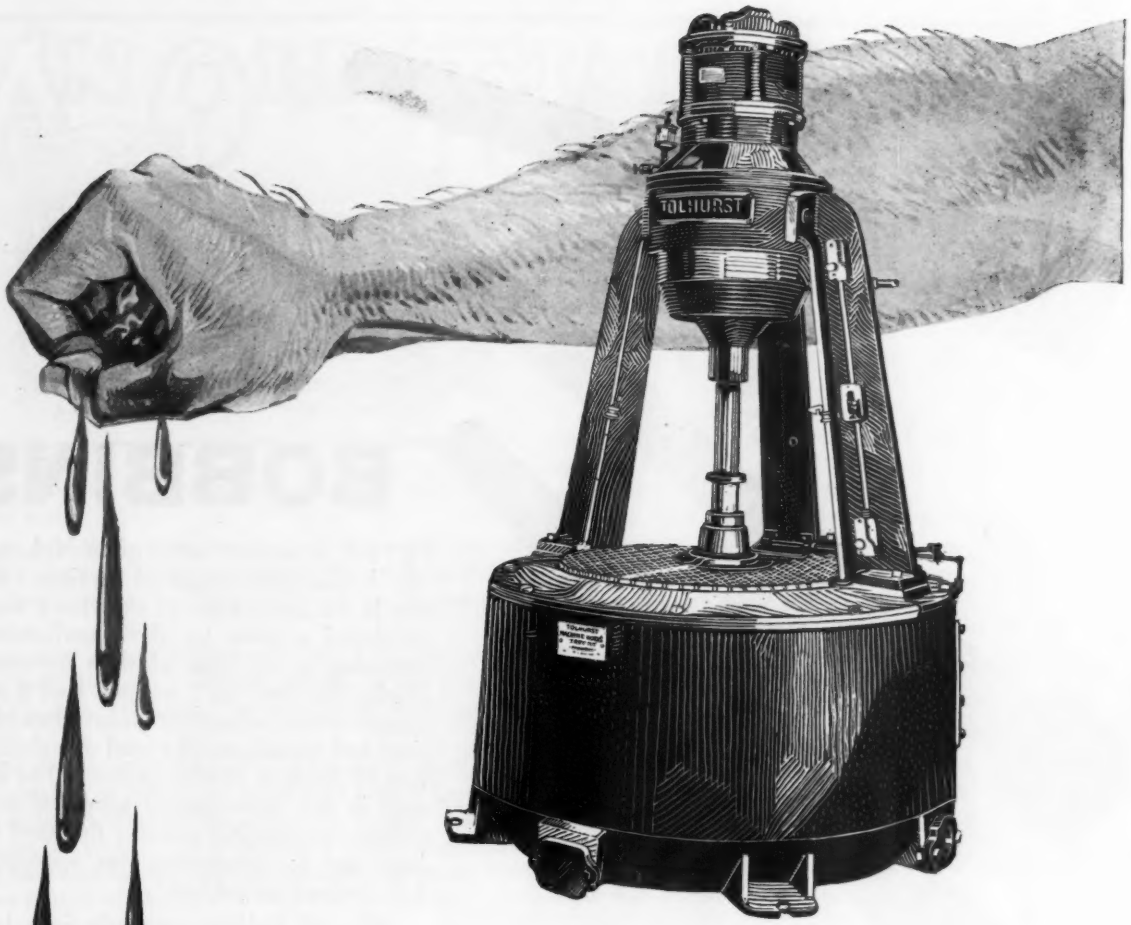
LUTHER BROWN has been elected active vice-president of the Cannon Manufacturing Company, Concord and Kannapolis, N. C., succeeding S. C. Simmons, resigned.

FRANK BUCHANAN has been promoted from second hand to overseer of carding at the Dallas Manufacturing Company, Huntsville, Ala., succeeding the late M. L. Leary.

J. D. WATKINS has resigned as overseer of spinning at the Dixie Spinning Company, Glen Raven, N. C., to become overseer of carding and spinning at the Altamahaw Mills, Glen Raven, N. C.

R. B. HUNT has been transferred from overseer of spinning and spooling to overseer of opening, mixing and carding at the Ensign Mills, Forsyth, Ga.

J. M. HANCOCK has located in Charlotte, N. C., as southern representative of the Hyatt Roller Bearing Company. Mr. Hancock has been with the company for a number of years and is an expert on transmission problems.



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U S Bobbins for conditioning yarn are enameled by our own process.

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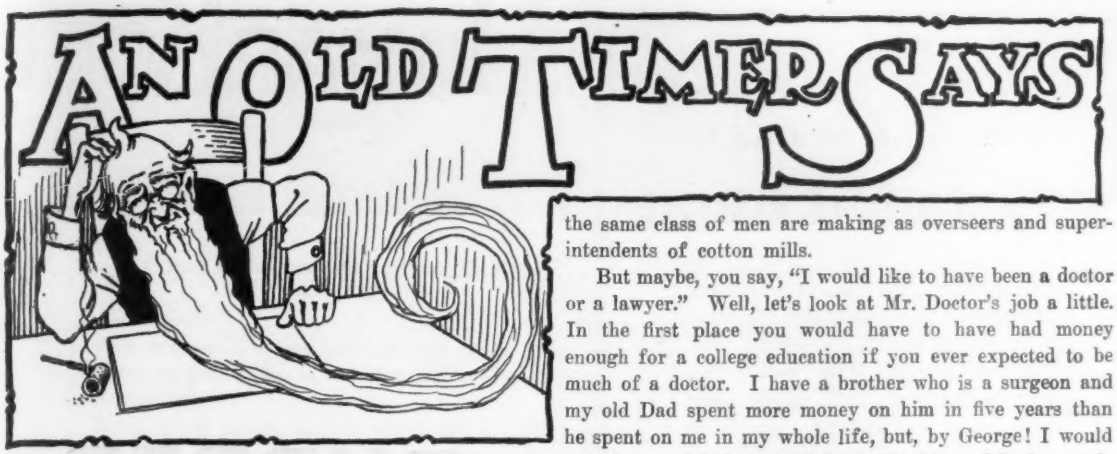

A man will remain an overseer as long as he has an overseer's vision.

We all have to work, but why make it a grind? The majority of overseers and superintendents look upon their work as something they are compelled to do for an existence.

But, brother, if you will just turn the thing around and begin to look upon your work as a pleasure, it will give you new life, and, incidentally, you will certainly run your job better.

Most of us look at work from the wrong angle. I suppose it is because as children we hated work when it kept us from pleasure. When Dad said cut stove wood or turn while he ground the axe, or hoe the garden, it was always just at a time when the boys were going to play ball or the crowd was starting for the old swimming hole, or something like that, and all those things made us hate work.

But now since we are honest-to-goodness grown-up men, we are supposed to have some reasoning power in our brains. Well, if we have, why don't we just sit down and talk this "work" business over to ourselves?

I claim that any man in most any line of work can enjoy his work if he will go at it in the right frame of mind. I don't believe half the overseers and superintendents realize what a snap of a job we have in comparison to some other kinds of work, anyway.

Now wait a minute before you say "Old-Timer" has gone daffy or is trying to kid somebody. Suppose we—some of us—had started out to be merchants. Well, in the first place, we would have to work for about five years for about as much or less than one of our good frame hands or weavers could make, and pay more house rent to boot. Then if we didn't have a rich uncle or somebody to die and leave us a little stake, we would certainly have a hard time ever getting enough money ahead to start in business for ourselves.

Then look at the difference in the hours of work. It's true the clerk or the merchant goes to work a little later than we do every morning, but he works much later at night. Gosh! man, you don't know how to appreciate the Saturday afternoons off like we get unless you worked in a store a while.

Now begin to inquire around a little and see how many clerks or small merchants are making as much money as the same class of men are making as overseers and superintendents of cotton mills.

But maybe, you say, "I would like to have been a doctor or a lawyer." Well, let's look at Mr. Doctor's job a little. In the first place you would have to have had money enough for a college education if you ever expected to be much of a doctor. I have a brother who is a surgeon and my old Dad spent more money on him in five years than he spent on me in my whole life, but, by George! I would not give my job for a half dozen like his, and he has made quite a reputation as a surgeon, too!

Then look at the work the doctor has to do in comparison with our work as superintendents and overseers. He gets called at all times of the night, has to go in all kinds of weather, has absolutely no time to himself at all, and then can't collect for more than about half the work he does. I'll have to tell you a little joke I heard once on how a doctor is treated sometimes:

This doctor was roused in the middle of the night by a ring at his doorbell. Upon opening the door he found a man who wanted him to come to his house, about ten miles out in the country. It was raining like wild cats, but the doctor hurried into his clothes, cranked the flivver and they were off. When they finally got there the man got out very quickly and asked the doctor how much he charged for a night call. "Four dollars," the doctor replied, "but what are you driving at? Don't you want me to go in the house to see the sick person?" "No, doctor," replied the man, "I'll tell you how it is: I got in town on that midnight train and it was such a bad night those darn taxi drivers wanted to charge me ten dollars to bring me home. Here's your four dollars, Doc., good-night!"

Whether this story is actually true or not, it does illustrate just about what the poor old doctor is up against sometimes.

Excuse me! I'll take an overseer's or a superintendent's job every time.

Yes, I know you will say some doctors and some merchants make big money, but I can say the same thing about some superintendents, and remember, every overseer has already made a good start toward being a superintendent and the "size" superintendent he makes depends entirely upon *him*.

I have often made the remark to my brother superintendents and overseers that you do not have to print a big sign and hang it on your back to let people know what kind of an overseer or superintendent you are. If you are running your job right up-to-date, if you are beating the average man, you will be found out, and that bigger job is just as sure to come as taxes.

Think this over, Mr. Overseer and Superintendent, and you will begin to realize what a good job you have in comparison with many other kinds of work, and then probably

(*Continued on page* 503.)

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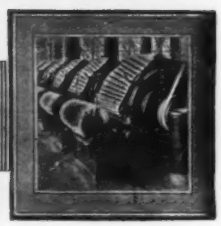

Some Questions on Cotton Staple.

EDITOR COTTON:

Will you please secure some answers to the following questions for publication in the "How Other Men Manage" department:

What staple cotton, carded, would you suggest using to make 30s/1, 45 turns twist? What breaking strength?

Do you think it advisable to make 30s/1, 45 turns twist, out of 1 1/16-inch cotton? Contributor No. 13.

Figuring the Weight of a Square Yard of Fabric.

EDITOR COTTON:

I would be greatly obliged if you would give me some information for figuring the weight of fabrics per square yard. Here is an example that was put up to me.

What will a square yard of cord fabric weigh—with 4s warp, 34 ends per inch, 20s/1 filling, 2¾ picks per inch? Contributor No. 38.

EDITOR COTTON:

Answering "Contributor 38's" specific question:

840 yards of 1s yarn = 1 pound. Therefore 3360 (4 × 840) yards of 4s yarn = 1 pound.

34 (ends per inch) × 36 (inches) = 1224 yards of 4s yarn in piece of cloth 36 inches wide.

2.75 (picks per inch) × 36 (inches) = 99 yards of 20s yarn in a piece of cloth 36 inches long.

7,000 grains = 1 pound, therefore, 3360 yards of 4s yarn = 7,000 grains. Then, 1 yard of 4s weighs (7000 ÷ 3360) = 2.083 grains, and 1224 yards weigh (2.083 × 1224) = 2,549.59 grains, which is the weight of the warp yarn.

1 pound of 20s yarn = (20 × 840) = 16,800 yards.

7,000 ÷ 16,800 = .4166 = weight of one yard of 20s yarn.

.4166 × 99 = 41.2434, which is the weight of the filling yarn.

2,549.59 (weight of warp) + 41.2434 (weight of filling) = 2,590.83 grains = total weight of one square yard.

1 ounce = 437.5 grains.

41.2434 ÷ 437.5 = 5.92 ounces = weight of one square yard. S. B. (Ga.)

EDITOR COTTON:

Here is a solution to the problem of "Contributor No. 38" on figuring the weight of a square yard of cord fabric. Taking his example:

34 (ends per inch) × 36 (inches per yard) = 1224 ends in warp or yards of warp yarn in one square yard of goods.

1224 × 16 (ounces per pound) ÷ (4s × 840) = 5.828 ounces of warp yarn in one square yard of goods.

We invite our readers to make use of this department for the discussion of any and all problems arising in the mill or the finishing plant. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

The warp yarn may also be figured, by a shorter method, thus:

$$\frac{34 \times 36 \times 16}{4 \times 840} = 5.828 \text{ ounces of warp yarn.}$$

2.75 × 36 (inches per yard) = 99 yards of filling yarn in one square yard.

99 × 16 (ounces per pound) ÷ (20s × 840) = .0943 ounces of filling yarn in one square yard of goods, which can also be secured by the short method:

$$\frac{2.75 \times 36 \times 16}{20 \times 840} = .0943 \text{ ounces filling yarn.}$$

Then 5.828 + .0943 = 5.9223 ounces, weight of one square yard of his goods.

The easiest formula for working problems of this kind is as follows:

$$\frac{\text{Ends per inch} \times \text{width at reed} \times \text{ounces per pound}}{\text{Counts} \times \text{Standard}} = \text{Weight of warp in ounces per yard.}$$

$$\frac{\text{Picks per inch} \times \text{width at reed} \times \text{ounces per pound}}{\text{Counts} \times \text{Standard}} = \text{Weight of filling in ounces per yard.}$$

This is for one yard of goods neglecting shrinkage and contraction. F. A. M. (Ga.)

Teaching the Right Way.

EDITOR COTTON:

I have often wondered if we make a mistake in applying prohibitive measures to our operatives; that is, how *not* to do things in the mill, and whether we should show them the right way, saying nothing of the wrong way. I noticed a quotation recently that said, "He who is least governed is best governed," which means that we should only show the operative the correct way of doing things and leave out the rigmarole of wrong ways insofar as possible.

But I have noticed that if we only instruct the operatives in the right ways of doing things, we have less resistance

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MUCH too frequently the quality of the filler rod used in oxy-acetylene welding is unknown. Competent operators, efficient apparatus, and pure gases are not enough to produce a weld with a sufficient *factor of safety*. The welding rod also must be right.

The break always occurs at the weakest point. The only way inferior welding rods can give strength is by "building-up." Many times, however, the welded part must be ground or machined and so it cannot remain "built up." Then the weld still remains the weakest part—unless Oxweld welding rods are used. Their chemical and physical properties are uniform and they give the necessary *factor of safety*.

In buying welding rods you should remember three things: (1) No weld is stronger or better than the filler rod used; (2) The cost of filler rods represents the smallest item of your welding expense; (3) Oxweld can furnish you with welding rods which will give you the needed *factor of safety*.

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when we do have to correct them, because we have instructed them in the way we want things done. I recall that once, when I was a young chap, I heard an old gentleman giving his views on this question to ten boys. He said, "Boys, it's this way: suppose you had a bushel of fine apples with one little scrubby crabapple in the lot, and were going to pour them out before a bunch of pretty girls, at the same time saying, 'Girls, here are some apples, but among them is one crabapple, which you must *not* touch.' When the apples were poured out and your head was turned, they all would make a dive for that crabapple. Why? Because you had told them *not* to do it, which creates a desire in human nature to do that very thing." It is the same, in a sense, with managing operatives in a mill.

Being a man with no "pull" in the mill business, except what I produced myself, I adopted some of these common-sense principles to gain the sympathy and cooperation of the operatives. I found them to work mighty well, as I most always had plenty of help, and the spinning room plenty of roving to keep them going, as I was then in the carding end. In the meantime I tried to produce a very fair product. I have made it a policy in my twenty-three years in the game to teach the operative only the right way of doing things, leaving out the wrong ways; carelessness will produce enough of those.

This brings to mind an incident that occurred to one of my drawing frame tenders, a very mischevious chap. There was a big revival meeting going on at the church, and this boy was taking it very seriously, but no one gave the matter especial attention. But one night, when the doors of the church were opened, this chap went up and joined the church. During the ceremony he was asked some few questions as to his life and the changes that had taken place. The young fellow deliberately turned to a lady who had been his Sunday school teacher, and, pointing to her, stated that she had shown him the way.

That instance illustrated very pointedly that the best way to handle people is to show them the right way, and so from the picker room on through the mill I try to make this my motto: show them the right way and let the wrong way take care of itself. Take the picker room for instance, where I want things done a certain way, I tell the operative the way I want it done and educate him that way, such as in lapping aprons, always to put the full laps on the aprons at the first and third places, doing this easily and lightly so as not to interfere with the apron holding its balance. This keeps the apron from jerking and thus causing the cone belt to be put to an extraordinary strain which might make it slip and thus make a thin place in the laps on the finishers.

On the cards, I tell them to put the new laps on with care, lapping them just enough to make sure there are no thin places, and not lapping them enough to make a thick place in the sliver. Never allow the cans on the cards to get too full, and have a standard to have them doffed by.

On the drawing frames, piece the drawing slivers, in setting in a new can, so that they will just touch and make an even strand of sliver. The same rule applies in piecing on the slubbers to make an even strand, and on all roving frames; and in the spinning rooms, piece the ends so that it can hardly be identified at the next process. This makes better running work all through the mill.

I may have more to say about other departments later on. But one thing we must bear in mind: we must deal with people as they are, and not as the idealist would have them be, for there is always another day coming, and we should so conduct ourselves with them that we can look them in the face and say, "I tried to lead you the right way, and if I failed the mistake was of the head and not of the heart."

T. A. D. (Ga.)

Some Questions on Sateens.

EDITOR COTTON:

I am sending a number of questions regarding sateen. I shall greatly appreciate it if some of the weaver readers will discuss these questions in "How Other Men Manage."

What is a "filling sateen?" What is a "warp sateen?" Which is the better way to make it, four down, one up, or four up, one down? Which way should the harness break, from the front to the back, or the back to the front? Why? How should the warp threads interlace with the filling? Which is the best way to draw the warp in the harness? Which is the best way to set the harness cams, on bottom center, or late, or early? If late, or early, why? Which is better, to run sateen on Lacey top, or Dwight spring top? How is the best way to set tape selvage cams to make the selvage weave smoothly into the cloth, or warp? How should the tape selvage be drawn, from the right hand or left hand? Which two of the five harnesses are level when the tape selvage harnesses are level on one end?

Sateen (S. C.)

EDITOR COTTON:

Replying to "Sateen," an advance copy of whose questions were sent to me:

A filling sateen is one where the filling predominates on the face of the goods. Taking a five end sateen, this would be a 1 up and 4 down weave and the cloth would contain a heavier pick than sley, for example: a 72 sley and 150 pick. In this weave the warp is nearly all covered on account of so much filling floating on the face of the cloth. The great majority of sateens are woven with this weave. Filling sateens have a wide range of uses such as: linings for garments, dresses, shirts, aprons, ladies' underthings, corset covers, etc. Jewellers and undertakers consume large quantities. Many thousand yards are printed and used for draperies. They are usually woven in the grey and bleached, dyed or printed as the trade demands.

A warp sateen is one where the warp predominates on the face of the cloth. A 4 up and 1 down weave with a heavier sley than pick. For example: 152 sley and 80 pick. This cloth shows practically all warp on the face as the interlacing of the threads depresses the filling and raises the warp.

Some of the fabrics woven in warp sateens are: fancy ticking, coverings for upholsterers' work and woven striped sateens. The shadow stripe bloomer cloth, so widely sold at present, is a warp sateen with alternate groups of a dozen warp threads more or less, with reverse twist inserted.

Weave the filling sateen face up on the loom, 1 up and 4 down. Only one-fifth of the ends are raised. The face of the cloth is in full sight of the weaver and defects are quickly noted.

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Warp sateens should be woven face down if of very heavy sley. This makes the weave 1 up and 4 down, necessitating lifting but one-fifth of the ends when shedding. But the face of the cloth is hidden and defects sometimes extend for long distances in the fabric before they are detected.

From now on we will consider merely the filling sateen as this fabric is produced greatly in excess of the warp sateen.

Weave the filling sateen 1 up and 4 down. Harnesses can be set to raise from back to front: 5-3-1-4-2, or from front to back: 1-4-2-5-3, as the weaver prefers. Two large mills, close neighbors, on the same sateens break their harnesses differently and each prefers his own idea. Draw in the warp straight draft: 1-2-3-4-5, front to back, as follows in Fig. 1.

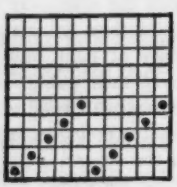


FIG. 1

Set the cams to raise the harnesses 5-3-1-4-2 and get a "smooth face" sateen like Fig. 2.

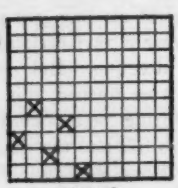


FIG. 2

You can also set the cams to raise the harnesses as follows: 5-2-4-1-3, and get a "twill face" sateen like Fig. 3.

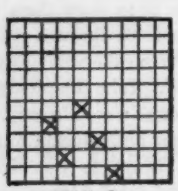


FIG. 3

This sateen is not in much demand but some customers desire it.

Timing the harnesses depends to a great extent on the construction of the sateen being woven. A good set to start with on a medium construction, say 72 sley, 130 picks, 40's warp, 48's filling, would be: harnesses 1 and 3 level, with reed 2 inches from the fell of the cloth.

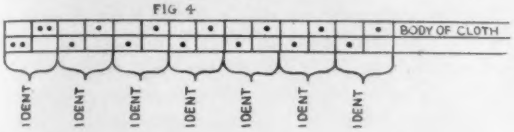
Set the tape selvage as follows: shuttle in left hand box, selvage level on left hand side, reed 1½ inches from fell of cloth. When the shuttle is in this box and the selvage level, the harnesses that are level will be 1 and 3. Then when the shuttle is picked across and back, 2 and 4 will be level, then picking again, 3 and 5 will be level, next 1 and 4, then 2 and 5.

A nice selvage for this type of sateen would be 16 threads of 40's two ply on each edge, drawn in and reeded as follows: 2 in an eye, 2 in an eye, these 4 in one dent;

1 in an eye, 1 in an eye, these 2 in one dent. Repeat 1 in an eye and 2 in a dent 6 times like Fig. 4.

Either Lacey or Dwight spring top will work well,

FIG 4



though the Lacey rig requires less power and does not keep the excessive strain on the straps, harnesses, and cams that the continuous tension of the springs exert.

Sateens to be right must be started from the cotton bale. You can take any old yarn with any old twist and make a sateen weave, but if everything is not selected and properly handled from the bale to the cloth room, the sateen will never sell Or if it does sell, it won't stay sold.

Cap. (D. C.)

Removing Lint From the Top of Brushers.

EDITOR COTTON:

In reference to the letter of "Quidnunc (S. C.)," in the December issue of COTTON, in which he brings up the question of carrying off the lint from the top side of cotton cloth brushers instead of holding it in the machine, and asks why this has not been done—I am sending two photographs with this letter. Fig. 1 shows how we have placed ducts or exhaust piping onto many of our brushers. While this is not a common practice it is frequently done and has proved very satisfactory when the machine has been so equipped. The only trouble is that the manufacturer wants all the extra equipment that he can possibly get without any additional expense, and when we have called their attention to this appliance and added the price of it to the price of the brusher they have demurred and decided to put on whatever device they wish at the mill.

We are also sending another photograph, Fig. 2., which shows one of our larger brushers where the hoods

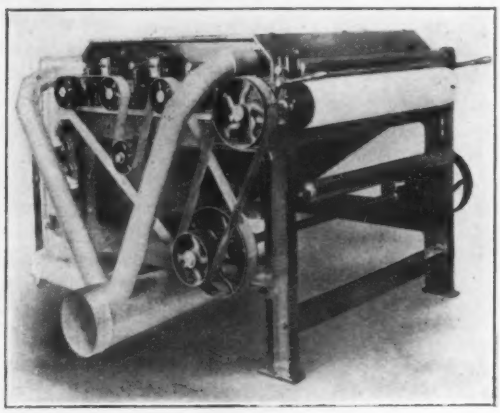


FIG. 1.

are on the top. This method we usually apply to all of our wide brushers, including it as regular equipment, and it has proved very satisfactory.

Of course either one of these methods can be applied to any old brusher if desired, though in most cases we much prefer to have an exhaust fan of larger capacity than is ordinarily furnished with the brusher without these attachments and have the exhaust fan located outside of the brusher itself.

Curtis & Marble Machine Co. E. H. M. (Mass.)

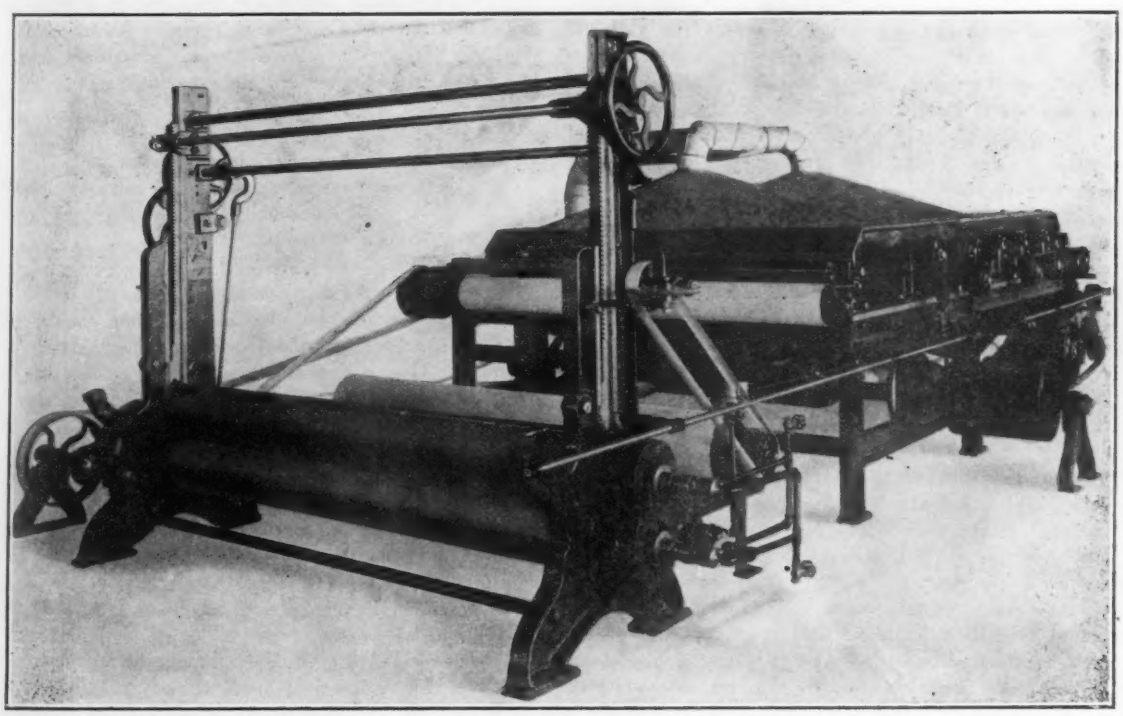


FIG. 2.

Frame Speed and Cone Outline.

EDITOR COTTON:

It was my first intention to just point out the error in the statement that a variation of the frame speed requires a different outlined cone. I do not consider the mathematical part of the proof so important as some of the readers do, because it is so simple for those who understand mathematics and at the same time so tediously hard for those who have not had the training.

After I made the remark in November COTTON of last year, I found a letter in the January number to the opposite effect as expected. The writer makes no apologies in leaving out the mathematical part of the proof in his first letter on the subject because of the reasons given at the beginning of this letter. Nothing pleased me more than to hear that your readers want the mathematical proof. But I doubt that. If they do want the mathematical proof, why not make a thorough study of it first? I certainly did give in my letter where they can find such a proof.

As I said in my first letter that the speed of the frame does not enter the equation at all, I think it is my privilege to ask those who claim otherwise to demonstrate to us just what are the differences between the outlines of cones having different frame speeds. When I want a proof, I want a general one. I would like to see their equation, or equations, including all the factors they claim expressed in their proper relations mathematically. I would also like to see it demonstrated to us, mathematically, how it works with the variation of the speed. To use a mathematical expression, I would like to see the "family of curves" they claim. I will tell you the reason why I want a general proof. It is because special cases are many times misleading. For instance, any student of mathematics can tell that there are at least two points where a straight line cuts a curve. At those particular points the values of the variables satisfy both equations. So it is not safe to draw conclusions from those particular cases unless the character of the equation is known.

When I said that I would leave out the mathematical part of the proof, certainly I did not mean to say, "There ain't no such animal." I am going to demonstrate, by applying the equations that I will give later in this letter, why the statement on page 326 of February, 1923, COTTON was wrong—and so were many other similar statements.

Next we come to the point where the writer of that letter seems to agree with me that "the curve is a hyperbolic curve regardless of the speed." I hope he thoroughly understands what that means but I fear not. I know he does not when we read "'H. H. Y.' should please be reminded that the term 'hyperbola' does fit in this case, there are two cones to be considered, and the cone belt is made to move laterally one makes for a greater angle to the base while the other to a less." First of all the term "hyperbola" is quite different from that of "a hyperbolic curve" in the strict mathematical sense. "A hyperbolic curve" is *a* curve while a "hyperbola" has at least *two* curves. Secondly his proof is not sufficient to show definitely it to be a hyperbolic curve. Two cones of *any* curve can be made to make "the belt made to move laterally one makes for a greater angle to the base while the other to a less." I will point out later how that can be proved definitely to be a hyperbolic curve. I am afraid that I have already gone too far into mathematics for the interest of readers. But I must add that there are two equations for the two cones—different equations, to be sure—each one is an equation of revolution of a different hyperbolic curve. That is why one cone is convex and the other concave. That is also why a straight lined cone will not work. Right here is a very good problem for the readers to solve. What must the modifications be in order to change the hyperbolic equation into a straight line equation? I tell you frankly that it is impossible. The two equations belong to two different classes—the straight line equation is a first degree equation while the hyperbolic is a second degree equation. Any one who is trying to overthrow these mathematical facts will be up against it. I think this is enough to show where the contributor is wrong in the statement, " . . . . a heavy pressure attached to certain make of flyer, condensed the strand or roving to such an extent as to call for a bottom cone having *straight outlines.*" There are other mathematical requirements that can not be fulfilled by cones having straight outlines. I will point that out later. I do not deny that cones having straight outlines have been made. But I want to warn the readers not to buy any of them.

We read further in the January issue, "In finding the true outlines of cones, each layer of a bobbin of roving must be considered separately, and the diameters of the cones figured for that layer alone. Cones are really so many separate pairs of pulleys connected together in a continuous string." Well, I consider that is the only part where the writer of that letter is right. But, taking it at its face value, it is far from complete. As a whole story, it is hopelessly lacking. The point I don't quite see is how any one can work out an equation of a straight line for a cone basing his reasoning on that statement.

Now I am going to give my equations, as well as the points that should be considered in roving frame cone designing. The equations themselves are amazingly simple, as I stated in the beginning . Here they are:

$$RL = K \qquad (1)$$

$$a + b = C \qquad (2)$$

Where R = radius of the bobbin
L = the relative angular velocity of spindle and bobbin
K = a constant
For (2)
"a" = the diameter of one cone
"b" = the diameter of the other cone corresponding to the first one
C = a constant

If you should insist on having the diameter appear in the equation, simply do this: Multiply both sides of the equation (1) by a factor 2. You will get

$$DL = 2K \qquad (1_a)$$

Where D = the diameter of the bobbin.

Here I want to add that the term "the diameter of the bobbin" represents the varying diameter from the bare bobbin to the full bobbin. Please don't mistake it as the bare bobbin only. These are the requirements that must be fulfilled in order to have the correct winding.

I may further add:

$$am = bn \qquad (3)$$

Where "a" = the diameter of one cone
"b" = the diameter of the other cone corre-

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sponding to the first

"m" = speed of the cone having diameter "a"

"n" = speed of the cone having diameter "b"

Readers will readily recognize that equation (3) is nothing but the equation for pulleys.

The length of this short article will not permit of going into every working detail of the problem. It is enough to point out what the main points are and leave the working details to the readers. It may help out a bit to refer to some standard works that the readers may see how these things may be reasoned out and what steps they follow. To that effect in addition to Mr. Taggart's work to which I have already made reference, I advise the readers to study B. M. Parker's "Cotton Mill Machinery Calculations," Mr. Parker needs no introduction. Both of the two books recommended are excellent. They approach the subject from different angles. Every phase of the problem is properly considered and thoroughly discussed. Mr. Parker deals with the subject more from the millman's point of view rather than mechanical. It is perhaps more easily understood by those who do not care for the mathematical part. While Mr. Taggart's work is more from the mechanical engineer's point of view. The designing part of it and the method used to show the hyperbolic characteristics used by Mr. Taggart are convincing as well as interesting. Mr. Taggart uses more than one method to do the same thing. It ought to prove interesting reading even to those who are not familiar with higher mathematics for he uses arithmetic to explain the mathematical facts. Readers will find no difficulty in understanding him.

After giving these references I think it justifies my leaving out how the above equations are obtained. But I will do a little better than that. I will point out how it can be obtained and what it means.

As the front roll speed is constant, therefore, the length of roving delivered in a given period of time is constant. Or in other words, the speed of the roving delivered is constant. It follows that the winding of the roving onto the bobbin must be constant. As the winding is effected by the difference of surface speed between the presser and the bobbin (this is true in both flyer-lead and bobbin-lead) it follows that this *difference in surface speed must be constant*. Well, that is what equation (1) means. RL = the difference in surface speed between the presser and the bobbin—and that must be constant. It is easy to see why this must be fulfilled in order that the successful winding can be effected. It is to fulfill this condition that cones and differential motions are designed. Any student of mathematics should have no trouble to tell at a glance that the above equation is a hyperbolic equation. But this is not the equation of the cones yet. Here is the important point that has been overlooked by those who claim that the speed enters into the equation. You will notice that the term "L" is the "*relative* angular velocity"—between bobbin and flyer.

Let me illustrate the above point in a more comprehensible manner. Supposing we have a flyer-lead frame and, of course, the flyer leads. Now supposing in a particular instance, the equation calls for the *difference in speeds* to be 10 revolutions. It makes no difference whether we get it by the combination, (290—280) = 10 or the combination of (100 — 90) = 10. Does it? The above fundamental equation (1) is fulfilled in both cases. Therefore it works. So, you see, the absolute speed of either spindle or bobbin does not alter the equation at all. So it may be left out entirely as far as the fulfillment of the condition goes. The absolute speeds of spindles and bobbins are used *only* in designing the spindle and the presser, etc. For in that case they are used in determining the dimensions of the spindles and flyers and so forth. There it is a necessary factor, but not here in the designing of cones.

Equation (2) means that the sum of the two corresponding diameters of cones should be equal to a constant. That comes from this: as the two axes of cones are parallel, and as the length of the belt is constant, it is obvious that at any point the sum of the two diameters plus the distance between their axes must be equal to a constant in order that the belt will not run loose at one time and tight at another. Therefore the sum of the two corresponding diameters of cones must be constant. The third equation needs no explanation.

By working with these three fundamental equations, the readers should be able to find the two equations for the two cones (equations in three dimensions).

If you get the foregoing right, you should be able to see that the statement on page 326 of February, 1923, COTTON satisfies neither (1) nor (2) of our fundamental equations; therefore it is wrong. I mean one of the systems or both. The data given there was not enough for us to try it out on our equations. But one thing is sure, if one of them satisfies our equations, the other can't. Take equation (2) for example; as given, the top cones are the same, and bottom cones different. How can anybody expect to satisfy the equation with these two systems? I think I need not go any further in my proof. Try it on any make of frame. If they don't satisfy the equations given, you can rest assured that it is poorly designed. You don't need to be worried over the fact that you have found out a difference in the cones. If I were to use an argument that some other contributors used, I would say that the fact that such a thing has been manufactured is not a proof that it must be right.

In closing I would like to say that every reader who wants to know must do his own thinking. The best I can do is to point out some of the things that might be overlooked. Reason it out. I learned a good lesson some time ago which is nothing more than this little word—"doubt." It is the beginning of wisdom!

I am interested to see how their equation or equations work. But the writer (whoever it is)who is going to answer my letter should please be reminded that I accept nothing less than a strictly mathematical proof. In that case he will have to show me the family of curves that he claims. That means to say that he will have to disprove the engineering and mathematical facts that now exist. I predict that whoever is going to try that is going to bring a hard time upon himself. Figure it out!

H. H. Y. (Mass.)

A new guard for mill type lamps, especially designed for the new 25 and 50-watt type lamps, has been developed by the Flexible Steel Lacing Co., 4607-31 Lexington St., Chicago, Ill. This Flexco-Lok guard is made of expanded steel, reinforced, tinned, and is furnished either with or without the locking feature.

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An Old-Timer Says—

(*Continued from page* 491.)

you will fall in love with your own job. And when you do, I can see that old production record fade away and a new record take its place. Then I can see that new light come into your eye, I can see how much more agreeable you are to your help, I can see how much better you are getting along with your brother overseers. Why, man! your blamed old flivver will even run better.

At any rate, won't you have confidence enough in "Old-Timer" to just give the thought a good fair trial? I'll certainly guarantee that you will not be any worse off. Don't be like the average overseer or superintendent who just goes in every morning and starts up and then waits for something to happen.

Get some of that old-time "pep" that you had when you got your first overseer's job. Remember how you just couldn't get things done fast enough and how you were going to beat the dickens out of all the superintendents and overseers in the world? That was a darn good resolution and think where you might have been today if you had stuck to it.

"It's never too late."

Balanced Twist Yarn.

EDITOR COTTON:

I am sorry that I cannot give the breaking strength of the 15s/2 balanced twist yarn, as requested by "H. H. Y." in connection with our discussion on this subject. I will say, however, that the stock from which the yarn was made was not over and above strong. None of our yarns came up to standard in strength, but with the exception of the yarns above 24s the stock was suitable for the class of goods we were making. From the same cotton that the 15s was made from we spun up to 30s but used a lighter lap for the 30s than for the other yarns. In making 30s we got our best strength with a multiplier of 5 to the square root. We also made 30s from Egyptian cotton 1⅛-inch staple, carded, from a 12-ounce lap, 7-hank roving, double roving in spinning, same as the 30s spun from American cotton; the breaking strength of the 30s from Egyptian cotton with a twist multiplier of 4.46 was 72 pounds for 120-yard skein; the other was 53 pounds for 120-yard skein.

For the benefit of "H. H. Y." and others who may be interested in ply yarn, I will take an extract from my notebook of a 20s/3 ply yarn that I made several years ago from 1 1/16-inch carded stock. The strength of this yarn was obtained by tests covering more than two weeks. We started spinning the single with the regular 4.75 standard for twist. Our first test of the ply yarn gave a breaking strength of only 110 pounds for 35-yard skeins. The order specified 130 pounds. We finally arrived at 3.25 for a twist multiplier and began to get results. Not that we got any stronger yarn from the spinning, but the strength of the ply yarn was developed on the twister. With the slacker twist in spinning we got a better appearing yarn in the ply. Our twisters were equipped with 2½-inch vertical rings. Out of numerous tests the best results in twisting were obtained by using a No. 13 traveler. In making ply yarn for appearance and strength, care should be taken that the right traveler is used. If a mill's travelers are made to sample, the traveler used will affect the appearance of the yarn, for or against, so that tests are necessary. There is another point in connection with twisting that is not generally known and that is the delivery of the threads through the guide wires and over and under the delivery rolls. The ends should not ride across each other; they ought to run parallel to each other to get the best results.

The 20s/3 yarn mentioned was spun from double roving, 1 1/16-inch stock, with a draft of 8 in the spinning, and a twist multiplier of 3.25. The ply was 12.31 turns per inch, traveler No. 13 on 2½-inch vertical ring. Breaking strength, 135 pounds for a 30-yard skein.

J. J. B. (Conn.)

Favors Humidification and Tells Why.

EDITOR COTTON:

I have been connected with the mills for some time and have been an overseer in different departments for the past twenty years, and to my mind the only process in a mill that doesn't need humidity at certain times is the slasher room. I claim and can prove that we need humidifiers in the picker room and card room, at times, just as much as we need them in the weave room, and we all know that we must have them there.

I say that every man in the mill from the "big gun" on down to the section men should know the full value of humidifiers and how and when to use them; this knowledge plus what we have already learned will help us, I am sure.

Let us take as an illustration, a mill with 40,000 spindles and 1,000 looms all on four-yard goods, making, say, 20s yarn with a production of .4 pound per spindle per day. This would be 16,000 pounds, and we will suppose this as 100 per cent production. Now the question is: How much cotton will it take to run the mill a day? I say without humidifiers it will take at least 20,000 pounds, which would be 20 per cent waste, but the right kind of a humidifying system, used in the right place at the right time, would reduce this waste to less than 10 per cent, besides all the worry caused by uneven numbers without humidification.

We shall assume that this is a good mill, in a good location, and that everything is running along nicely and everybody seems to be pretty well satisfied. Well, that's good, but let's look at things as they do happen sometimes. Say we have had a long dry spell this Fall and everything has been running nicely for the last two months, with the numbers running pretty close to standard, and we are getting off 95 per cent production, and over. The cotton is good and dry, so why should we worry? Well, let's see:

The work runs so good that the carder doesn't "see any use in being bothered with the humidifiers," so he shuts them off and forgets all about them. The spinner doesn't notice the difference, so here we go. But wait, let's see a little further! Along in the afternoon it begins to cloud up, and by night it is raining. It rains all night and all the following day. Now what happens? The cloth room overseer tells the weaver that the goods are getting heavy, the weaver tells the spinner and the spinner tells the carder. "Yes," says the carder, "I found my work all heavy this morning due to the rain, but I have lightened

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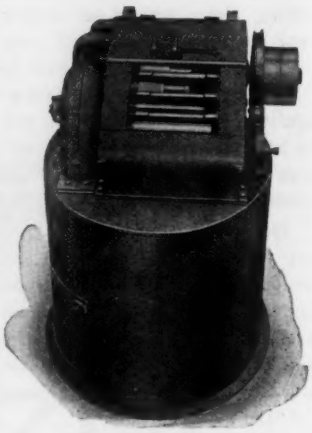

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We have certain other information about the Termaco mill executives will find interesting and valuable. Write our Engineering Department for it.

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up on my laps and my drawing and will start a man to changing gears on the speeders right away." About this time the superintendent comes through and finds the cloth heavy, and he gets after the whole bunch, so in order to get things right at once the spinner gets busy and changes about two teeth. Then what happens? Well, the weather clears up, the sun shines out, and the wind begins to come from the North. By morning it is so cold we have to turn on the steam to warm up the mill, and as soon as it gets warm the ends begin to break too light, but he knows the cloth is still heavy, so he will wait until afternoon to change his gears back. Then what happens? Well, everybody is feeling good from the change in the weather, and the president feels good, too, and goes down to the mill, meets the superintendent and asks how everything is going. "All right," replies the superintendent, "only our goods are a little heavy due to that rain we had the other day, but we have already lightened up and it will be all right by tomorrow." The president says, "Let's go down to the cloth room," and they meet the overseer of the cloth room and ask him how the cloth is weighing. "It's better than it was yesterday," he answers. "That bale over there is 20 pounds heavy, and the one in the press is 16 pounds heavy, and this one on the table is only 14 pounds heavy." The president puts on his glasses and begins to figure like this: 20 plus 16 plus 14 equals 50 pounds loss on three bales. Then he figures some more. Suppose the cloth is worth 50 cents a pound; 50 pounds is $25.00 lost on just three bales. Well, the president is a good fellow, but he is thoughtful also, so he doesn't know right at the moment but what that has been going on for some time, so he says to the superintendent, "This won't do, the stockholders are looking for a payday pretty soon, and we can't pay dividends that way," so the superintendent goes to the spinning room and finds the whole room in bad shape. The overseer has his section men all changing gears back like they had them before the rain, then they have an argument, the overseer gets mad and fires two or three good spinners, cusses out his second hand and all his doffers and puts them to spinning. The superintendent gets an armful of yarn out of the bin and goes to the sizing table, and what does he find? It's like this: the roving that was made before the rain, and the roving that was made during the rain, and after the rain, is all mixed together in the creels, and the yarn sizes anywhere from 16s to 24s.

Yes, that's pretty tough, but wait, the trouble isn't all over yet. A few days later the superintendent notices that production is dropping off in the weave room, so he goes to the boss weaver and asks the trouble, and he shows him. The weavers all over the room are tying in warps, then he will explain that the warps are so rotten that they won't run, so the superintendent, who has forgotten the trouble he had with the rain a few days before, decides to put a little more twist in the yarn. Well, more trouble ahead. About a month later, the president comes down to the mill again and finds a lot of looms stopped for warps, then another row starts—but I'll let you settle it in your own mind while I figure a way to prevent such trouble.

Now I don't want any carders to think hard of me for what I am going to say for I have run a card room myself and know how to sympathize with you, but you see what a mess we got this mill in, so let's not allow it to happen again. I say that if we had kept our humidifiers running during that dry spell and kept our relative humidity up to 65 per cent, we would not have had that trouble, and we would have saved the company thousands of dollars. Let's figure a bit: Suppose we start right now and put two per cent humidity in our goods and see what it will be worth, besides the trouble it will eliminate. The capacity of the mill is 16,000 pounds. All right, two per cent of 16,000 is 320, which takes the place of that much cotton. Figuring the cotton at 30 cents a pound, that makes $96 worth of cotton saved in one day, or $28,800 worth in a year of 300 days. It strikes me that would pay for a pretty nice humidifying system, and I feel sure that our company would install it if they were sure we would use it as we should.

I want to say in conclusion that if we keep our humidity up to where it should be when it is dry, we haven't got anything to do but shut our humidifiers off when it rains, and the cloth will stay close to standard, if other conditions are right.

C. A. T. (Ala.)

Slack Yarn at Warpers and Slashers.

EDITOR COTTON:

"Mack (Ga.)" doesn't seem to be able to get his axe ground with me on the question of slashers and warpers, or so I take it from his letter published in the September number. I respect very highly our "old timers" and their opinions, but it grieves me when they take issue with me when I *know* that what I write is *as I am doing it*. A man should first of all realize that conditions materially change things from one mill to another, and covering the roller on the warper is only done in order to take care of the friction in the warper creels, because anyone who is familiar with warper creels knows that there is a considerable difference in the tensions of the different spools on the warpers, and anyone who has the original bearings in the measuring rolls knows that they will get worn and will not measure accurately from the fact that they are worn, and the thread will slide over the roll and will not be measured.

I may have been a little too serious in my statement on the preparation of sizing materials on the slashers. What I meant was that the overseer of weaving is the only one who knows when the slashing is running to the best advantage in the weaving. And for him to have to go to the superintendent and report how it is running, and the superintendent to go to the boss slasher man and make the correction, is not going to get anyone anywhere much, for the slasher man will usually have his way out, and maybe the superintendent does not exactly understand the trouble and cannot state briefly just what he is after. The result is a mixed-up job, and I still contend that there should not be a liaison officer between the overseer of weaving and the slashers or the man in charge of the slashing. And I am willing to leave it to the opinion of the readers of this department.

"Mack" says he never asks anyone to remedy his faults or careless work. Why, that's what this department is for—to ask questions to help us overcome some difficulty we are up against, and even carelessness if we should drift away from the standard and forget the way back to the right road of efficiency. I don't ask questions on what I

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am not having trouble with, and the covering of the rollers on the warpers may sound out of order to "Mack," but on a fine warp yarn on warpers, and especially on old warper creels, they are the coming thing to take care of the loose threads and the ones that haven't got sufficient friction on them to hold them steady. The spools in the creels that have friction are the ones that run this roller, and if you don't have something to take the excess yardage, or to check the easy running threads to keep them from being pulled over at the mercy of the beam on the front, you are bound to have slack wound yarn, which means it is unwound on the slashers as "slack ends," which is bad for the slashing and the weaving.

And as for the waste on the warper beams as they run out on the slashers, to be exact, the average that I have, covering a period of six months with ball bearings, and as good a friction as I can get behind the slashers, is six-tenths of a pound per warper beam. I have tried every remedy that I know of, and most everything that has been suggested, and I am now looking for a remedy from "Mack." How does he get the friction on his beams behind the slashers, and how much waste per beam does he average on his numbers of warp? T. A. D. (Ga.)

Finishing Khaki Jean and Interlining.

EDITOR COTTON:

I am enclosing herewith two samples of goods—one is a 36-inch khaki jean and the other is an interlining for the clothing trade. I would greatly appreciate it if you could obtain formulas for producing the same finish as is already on them; also the machinery necessary to handle this class of work on a small scale, particularly the interlining.

C. K. (Wis.)

EDITOR COTTON:

Replying to "C. K. (Wis.)," I would say that the 36-inch khaki jean may be finished about as follows: After dyeing and mangling the goods must be dried as cool as possible on the cylinder drying machine.

They must then be starched on a three-bowled starch mangle having one brass (center) and two rubber rolls, using two nips, with the following starch mixture: 150 pounds of corn starch; 50 pounds of glucose; 20 pounds of soluble oil or castor oil soap; and 100 gallons of water. Boil until thin, or one hour.

Dry on cylinders and cool off until cold or nearly so, then damp on sprinkler and let lie for two hours, calender over revolving stretcher, one nip over wooden calender or conroy will answer, perhaps the starching mangle might be used for this purpose. The object of calendering in this case is to break up the stiffness of the goods over the stretcher and not to put any gloss on the cloth.

Interlining. The interlining may be starched as above with the addition of 50 pounds of Epsom salts and probably reducing the soluble oil to ten pounds. In this case the goods can be run through a starch box connected with the dryer and fitted with an immersion roll and two 8- or 10-inch squeezing rolls and from this directly onto the dryer so that the starching and drying may be completed at one operation. I might say right here that perhaps "C. K." could starch and dry the khaki also in this manner, at any rate he might try it. The interlining, after starching and drying must be cooled and sprinkled in the same manner as the khaki, but it must be calendered much more heavily to give it a smoother finish, perhaps the mangle might answer to do this if the weight was put on heavily.

If "C. K." finds the goods coming too stiff, it is easy to add a little hot water to the size and thin it down.

Probably "C. K." could arrange a machine, connected with a drying machine that would dye, starch and dry the khaki at one operation and the same machine would starch and dry the interlining. It is possible to dye in the starch with some direct colors, i. e., the dyeing materials and the sizing materials are mixed in the dyebath and the goods, for heavy shades like "C. K.'s" samples, are given two runs and at the second run are passed directly to the dryer.

W. B. (Maine.)

Another Fly Frame Comment.

EDITOR COTTON:

"Bab's" article in the August issue, advocating the bobbin-lead fly frame, is very pleasing to me, as it gives me the opportunity to prove that most defenders of the bobbin-lead system do not understand the flyer-lead system.

Let us take the fourth paragraph of "Bab's" article: He says, "In summing this up, it should be seen that any lagging on the part of the bobbin, or the flyer starting in advance of the bobbin, will cause the roving to be stretched on the flyer-lead frame."

This may help him: When the bottom cone is raised the speed of the bobbin equals that of the flyer, the same as in the bobbin-lead. Therefore, in order to wind-on, we lower the bottom cone, which takes revolutions away from the bobbin, and winding on takes place. In such a case, it should be clear to anyone who has a fair knowledge of both systems that the bottom cone must be made to revolve at a greater speed.

Now stop and think what would happen in the case of the bobbin-lead if the cone belt was shifted to the small end of the cone to speed up the bottom cone. Stretch, of course.

Well, that is what must be done in the case of the flyer-lead in order to have the bobbin lag behind the speed of the flyer. If raising or stopping the cone will stop winding, then if the cone hesitates, slackness of the ends is sure.

It was not so long ago that high authorities made the claim that any hesitation of the bottom cone would cause stretch, but I am thankful that at least their eyes are opened to this fact. But I fail to understand why "Bab" is unable to see that to have the bobbin lag behind the speed of the flyer is an impossibility. Of course the bobbin lags behind the speed of the flyer at all times during winding, but what I mean is, if the belt is at the proper point of the intermediate speed to hold the relationship of the surface speed of the front roll and bobbin equal. In other words, the bottom cone takes revolutions from the bobbins, and in order to cause stretch, the cone belt must be moved toward the small end of the cone, and the same results on the bobbin-lead if the cone belt is shifted likewise.

Then "Bab" says, "another minor evil that was found in

the flyer-lead was that when an end did break the end surely would escape from the threading slot of the hollow leg of the flyer, so the bobbin-lead was a great improvement because, from what I have said, it can be seen that the bobbin takes the roving from the eye of the presser."

Now let's take his own statements in other parts of his letter. If the bobbin leads the eye so many inches to wind and the flyer leads so many inches to wind, is it not fair to assume that both systems are alike? Again, any pull would have a tendency to hold the end in the hollow leg. But "Bab" is a little twisted, and if he would think a minute he would know that the end escapes on bobbin-lead fly frames too, the cause being due to the construction of the slot in the hollow leg. It must be curved properly.

Then "Bab" says, "Therefore, its circumference velocity must be the same as that of the presser plus the velocity which makes up the two speeds." What "Bab" should have said is that its circumference velocity must be the same as that of the presser minus the velocity which makes up the two speeds.

Wash. (R. I.)

Mixed Yarn Computations.

EDITOR COTTON:

In the January number "J. C. D. (Mass.)" asks for advice on how to figure the cost of 150 denier silk and a 30s cotton yarn twisted together.

The standard length of reeling in the legal metric system of finding the size of artificial and real silk is 450 meters or 492.13 yards. The standard weight of denier is .771618 grains per denier.

$$\frac{492.13 \times 7{,}000 \text{ (grains per pound)}}{.771618} = 4{,}464{,}528 \text{ yards.}$$

Cotton standard = 840 yards.

4,464,528 ÷ 840 = 5315 constant for equivalent cotton counts.

For 150 denier this would be 5315 ÷ 150 = 35.4 equivalent cotton counts.

The rule for finding the price of two-ply yarn when yarns to be twisted together are of different values and different counts is as follows: Rule—Multiply the highest counts by the price of the lowest and the lowest counts by the price of the highest. Add the results and divide this result by the sum of the counts. The answer will be the price of the ply yarn.

Thus 35.4 × the price of the 30s, and 30s × the price of the 35.4s, added together, and divided by 35.4s + 30s (65.4s) will give the cost of the ply yarn. This is the only system I know of to find the cost of ply yarns of different materials.

W. O. R. (Mass.)

Suggestions for Roller Settings.

EDITOR COTTON:

Answering "W. M. T. (N. C.)," in the December issue, with reference to roller settings—

Roller setting is a very important point to be considered if a good even yarn is to be produced. The breaking strength is also greatly dependent on properly set rolls.

If metallic rolls are used on the drawing frame, I would suggest setting from center of front roll to center of second roll, ⅜ inch over the length of the staple; distance from center of second to center of third rolls, ½ inch over the staple; and on the third to fourth pairs of rolls, ⅝ inch over the length of the staple. The reason for increasing the distances over the length of the staple for each pair of rolls as indicated is that the sliver is heavier at the back rolls; it is, therefore, harder to draw and requires a wider setting.

If the rolls are leather covered, these distances should be reduced ¼ inch at each point, due to the fact that leather covered rolls do not bite as far from their centers as do metallic rolls. In "W. M. T.'s" special case, if the rolls are metallic, he cannot get a proper setting, as the roll diameter is too much. (That is, the front roll is too large.) The next best thing he can do is to set the rolls as close as possible; and if the sliver is somewhere in the neighborhood of 60 grains or under, it might be well to increase it from five to ten grains.

Some suggested roller settings on slubbers and first intermediates are as follows: Front roll to middle roll should be ⅛ inch over the length of the staple; middle to back rolls, 3/16 inch to ¼ inch over the length of the staple.

On second intermediates and fine frames, the front to middle rolls should be set, center to center, 1/16 inch over the length of the staple. Middle to back rolls, 3/16 inch over the staple.

However, there are a great many things that tend to influence roller settings, and as I do not know "W. M. T.'s" exact conditions, I shall endeavor to name several of these general influences and give my reasons for them so far as I am able.

1st. Speed of rolls. If an excessive roller speed is used, rolls must be set slightly wider, as a high speed tends to pull the fibers through in bunches if a close setting of rolls is used.

2nd. Drawing a heavy sliver or roving. A wider setting must be used as a heavy sliver is harder to draw than a medium weight sliver.

3rd. Using a short draft. Short draft does not reduce the thickness of the sliver nor pull the fibers apart materially, thereby leaving the sliver more or less intact. To overcome drawing through in bunches the rolls must be set wide.

4th. Using large rolls. This also requires a wider setting as a large roll will bite farther from its center than will a small one.

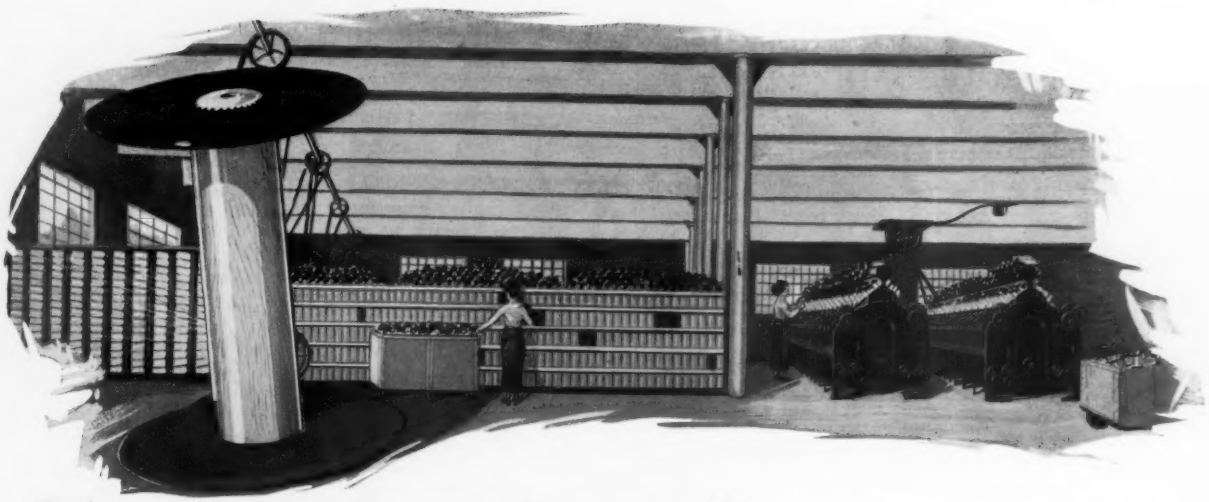
5th. Using metallic rolls. A wider setting is necessary with metallic rolls as the bite of the rolls is farther from the center than is the case with leather rolls of the same diameter.

6th. Hard twist. This requires a wide setting as roving twisted excessively is harder to draw than roving using a normal twist.

Some conditions call for a close setting, and the reasons for these will obviously be the opposite to those requiring a wider setting. Among them are small rolls, long draft, and soft twist.

It might be well to mention that a self-weighted roll will stand a closer setting. Also rolls with light weights can be set closer than would be possible using a heavier weight.

Another very important factor to be considered is the



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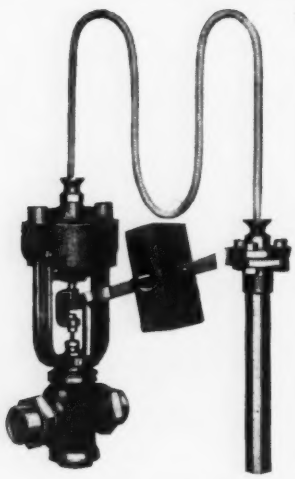

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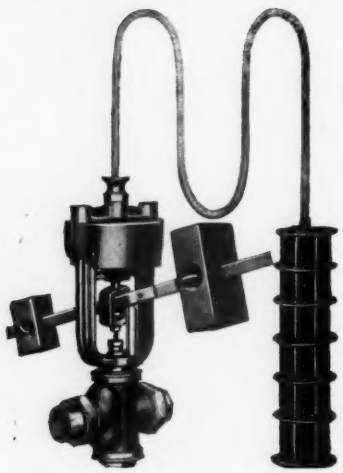

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cotton itself. A harsh, strong cotton, fully matured, will run well with a wide setting, while a smooth silky cotton would pull through in bunches with the same setting, the staple length being the same.

Roller setting is a point that only experiment can bring out to the best advantage, though a knowledge of the foregoing facts will greatly increase the chances of arriving at a more satisfactory conclusion. When "W. M. T." asked for the *best* roller settings he asked for something that is almost impossible to give, but I hope he will read these suggestions carefully and get out his set of wrenches and then let us know the results. C. C. (Mass.)

EDITOR COTTON:

In reply to "W. M. T. (N. C.)," who asks in the December number for the best roll settings for drawing frames and fly frames running 7/8 to 1 inch cotton, I would say that if he intends to be running this length of cotton indefinitely, the best thing would be to get some smaller diameter rolls. The rolls he is now using—1 3/8 inch front roll and 1 1/8 second, middle and back on drawing frames; and 1 1/8 inch rolls on fly frames—do not allow a close enough setting for the staple he is running.

If it is not possible for him to secure smaller rollers, my advice would be to set the ones he has as close as possible for best results. W. O. R. (Mass.)

Wishes to Increase the Breaking Strength.

EDITOR COTTON:

I am spinning 48s/1 combed yarn for weaving, from 1¼-inch strict good middling cotton. My breaking strength is too low and I have tried several different things to improve it but cannot get it over 44.

I have the following drafts: Cards, 114; sliver lap, 1.75; ribbon lap, 4.00; combers, 59; drawing, 5.50 on two processes, slubbers, 3.10; intermediates, 5.00; roving frames, 5.00; jacks, 6.90; spinning 11.25.

I use three processes of picking. Single beater breaker, three-blade, running 750 r.p.m.; intermediate, two-blade single beater, 900 r.p.m.; and finisher single beater (carding type), running 900 r.p.m.

I would like to have this proposition submitted to several of your readers for suggestions, and should appreciate your sending me advance copies of their replies as soon as possible. Contributor No. 92.

EDITOR COTTON:

Replying to "Contributor No. 92"—

A 48s/1 combed yarn, made from 1¼-inch strict good middling cotton, should break over 50. If I were Contributor No. 92 I would attack the problem from the following angles:

(1) The nature of the stock should be considered.

(2) The proper supply of moisture is of equal importance with the temperature.

(3) The uniformity in the length of the staple is important for the reason that the machinery in a cotton mill must be set for a certain length of staple.

(4) In doubling the laps, to hold as near as possible the same number of fibers in the cross-section of the strand is vital.

(5) It should be remembered that yarn is made weak by lack of twist, and also made weak by excessive twist. The variation in the number of fibers in the cross-section of the strand may cause both.

Taking up the first item named, one of the principal spinning qualities of a cotton is its strength, for upon this depends the strength of the yarn. This test is usually made by taking a small bunch of fibers (approximately the same number each time) between the thumb and forefinger of each hand, pulling them out parallel, and then breaking them. However, the individual strength of the fiber should be tested by a fiber machine. A fiber of strict good middling cotton should break over 97 grains, and when dry not below 80 grains.

As regards the second item, if Contributor No. 92 has no humidifiers, he is only reaping the results of the law of compensation.

The uniformity in the length of the staple is also important, because any variation in the length of the staple will cause undue frictional contact which will cause a stretched web at the drawing frame, which will vary the number of fibers in the cross-section of the strand more than anything else.

To attain the fourth item named—that of holding the same number of fibers in the cross-section, as near as possible—the same amount of stock must be fed in the opener. The beaters should be set to the feed rolls at a distance equal to a closed two-foot rule. The cone belts on the intermediate and finisher pickers should not be too tight or too slack. The licker-in on the card should be set as close as possible to the feed plate, and at a 12/1000 gauge from the cylinder. The cans from the cards should not be put up together at the drawing after doffing. If possible, cans running in one delivery should be full, 5/6, 4/6, 3/6, etc. The same method applies to the first and second drawing. This is an important point in the strength of yarn.

In considering the fifth item, Contributor No. 92 will find that his draft of 6.90 on jacks is excessive, and will cause undue frictional contact which may be partly the cause of the weakness in the yarn.

The card sliver should not exceed 40 grains to the yard. The speed of the doffer should not exceed 13 r.p.m.

Contributor No. 92 has the right hang-up, the only fault I can find is his draft of 6.90 on the jack frame. However, this would cause only a part of the weakness.

The trouble is in the stock or in the settings.

Wash (R. I.)

EDITOR COTTON:

In reply to "Contributor No. 92"—

I would recommend that he increase the draft on the slubber to 3.40. Leave draft on the intermediates, roving frames and jacks the same as given in his letter. This will enable him to reduce the draft on the spinning to about 10.10 or 10.15. My reason for making this suggestion is that I think the draft on the slubbers is rather low and the draft on the spinning is rather high.

D. M. (N. C.)

EDITOR COTTON:

In reply to "Contributor No. 92," I do not believe his trouble is much different from that which most of us have had, and if, in these hurriedly scribbled lines, he can find assistance, he will doubtless feel as the writer has felt many,

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many times when, just at the correct time, the practical, experienced carder or spinner has assisted him and directed him into the right channel.

Of course you know that, like a chain—in its links—yarn is as *strong* as its weakest fibers. At times it matters not what one may do regarding re-adjustments, yarn will not take on added strength for the strength of the fiber is not there.

But as a suggested lay-out, we will assume his cotton is not weak nor overabounding in strength—that it is of normal strength, so to speak. The speeds of his beaters, 750 r.p.m. for the three-blade and 900 for the two-blade, are, I should say, about normal, provided he feels that the lap coming from the intermediate picker is satisfactory. But the carding beater—I take it he means the Kirschner type—should not turn more than 700 r.p.m., with a fan speed so arranged as to barely remove the cotton from the beater and spread it upon the face of the cage and the dampers so arranged that the greater flow of air passes through the *top* cage.

Of course there should be no thick places passing over the evener shoes on the finisher picker, for these cause the evener belt to search back and forth across the face of the cones for a place to comfort its desires—namely, an even yard. Uneven yardage in picker laps is a great menace to good strength. This unpleasantness should be driven from the sizing by opening the cotton into fiber form if possible. This alone at times so greatly improves things in mills that you wouldn't think them the same places afterwards.

Perhaps after he has reduced his carding beater to 700 r.p.m. and his cotton has passed from the poor to the good opening stage, he may be able to run a 16-ounce lap and increase his card draft possibly to 158 inches, which would soften the card sliver and put it in better condition to work. I would suggest that he reduce the weight of the card sliver to the minimum which would allow him to shorten the draft in the sliver lap machine to not over 1½ inches; then set the rolls as far apart as possible, especially the back rolls; get away from the tremendous bulk beneath them, giving them a chance to draw the sliver out. They work terribly hard, and lightening their job will pay. His ribbon draft is good at four inches, but would be better at 3½ inches; set the ribbon rolls back away from one another far enough to draw the bulk. Ignore the staple in the sliver and ribbon machines, setting the rolls according to the bulk and shortening the drafts. He should assure himself of an even web from the ribbon lap machine—the combers demand it. The bunchy flakes should be taken out of the web. The comber draft is okeh—the longer the better of course, always. He should set the draw box roll away open on the back and hold up close to staple between the first and second to get an even sliver. He should *see that the percentages are equal in all his combers that are on one kind of work—be sure!*

The drawing drafts given in his letter are okeh—the two-process system is okeh also.

Regarding the drafts of the slubber, intermediate and roving frames, I would say that if it is possible he should arrange his drafts to read as follows: Slubber, 3.10; intermediate, 4.05; roving frames, 5.00, and make a thorough study of the twists in each of these machines, making sure there is enough twist, *but not too much.* He should make it a point to run as soft a twist as possible, for if there

is an overabundance the leather rolls simply cannot draw the work evenly, and too much twist causes very uneven sizing also—for experiment, remove all twist possible from some hank of fine roving, making it as soft twisted as possible, then place this roving in a spinning frame creel and make enough yarn for a size, match the sizing from soft twisted roving with that of hard twisted roving—I am positive the results will be astounding.

His jack draft and spinning draft are what I should call correct.

The Draper table of breaking weights of American warp yarns per skein shows 38.6 pounds for 48s yarn. This, of course, represents an average break for that number of yarn from a great number of mills, and by the letter of Contributor No. 92 I notice he has a break of 44 pounds and that he has tried several different things to improve it but have failed to lift it over 44 pounds. I understand it is the desire of every interested manufacturer to improve his breaking weight, for that seems to be the one point in view to a successful running mill. But personally, if I were Contributor No. 92, I should stop looking for extra strength and apply my energies to evenness. His breaking strength now shows 5.4 pounds over standard, and should be enough to warrant a beautifully running weave room provided other things were equal.

Commencing at the slasher and working backwards, the sizing used in dressing the yarn, the flexibility of the moving parts of the slasher, removing the strain on the yarn, the delivery tension relieved as compared with the take-up tension on the slasher, relieving the strain on the yarn, or otherwise properly preparing the warp, in a great many cases does more than a long search for strength. Tension relieved from warpers, using the correct speed, taking off all angle that the yarn has to pass under that is possible, regulating the speed of the warper properly, taking off the strain; running the spooler at the correct speed, stopping the harsh quick drag from bobbin to spool, having the thread guides set properly, removing the chafe —these things help. Furthermore, it will assist to use a good cushioned roll in spinning, run the frames at the proper speed (don't be a speed maniac), use the right weight traveler, lay the roving on the bobbin close enough to assure a solid new diameter at each change of traverse on the speeders, adjust the tension gear to take care of this close lay, slack up all the tension possible, attend to the setting of all leather and steel rolls, taking into consideration the bulk and staple and twist.

All tension should be removed on drawing frames, comber lap feeds and table. Use enough weight on the ribbon lap leather rolls, opening them up to get an even web; remove the tension between the front steel roll and the 5-inch calender roll on the sliver lap machines.

Finally—get an even picker lap, *open the cotton,* slow down speeds wherever possible, and stop looking for extra strength.

A. B. C. (R. I.)

EDITOR COTTON:

To begin with, in reply to "Contributor No. 92," who wants more breaking strength on his 48s yarn, I firmly believe, from the lay-out he gives, that he is picking far too much, and that his drafts are heavy all the way through to his spinning.

I would suggest that he reduce the speed of his pickers and also reduce the drafts. I deduce his weights from the meager information he gives, having only his drafts to go by. The following is the lay-out of weights and drafts of a mill I know of that is spinning the same numbers from the same cotton of good character as Contributor No. 92:

12-ounce lap.
45-grain sliver with a draft 116.6.
(Disregarding waste percentage.)
575-grain sliver lap, with a draft 1.70.
585-grain ribbon lap, with a draft 3.95.
53-grain comber sliver, with a draft 66.2.
(Disregarding waste percentage.)
52-grain drawing sliver with a draft of 6.00 plus.
.60-hank slubber roving with a draft of 3.75.
1.36-hank intermediate roving with a draft of 4.53.
3.25-hank roving frame roving with a draft of 4.78.
10.00 jack roving with a draft of 6.11.
47s-48s yarn (4.20 turns) with 9.60 draft.

The following are the picking processes: Bale breaker, two-section breaker with Buckley opener running at 450 r.p.m.; this breaker has evener motion; single three-blade finisher picker 750 r.p.m.—a total of 1,650 beats as against the 2,650 which Contributor No. 92 is giving his cotton.

I will say that the mill whose lay-out I have given above is getting a break of 50 to 52 pounds. If this dope helps Contributor No. 92 I would like to hear of it.

Jock (Mass.)

Carding Without Pickers.

EDITOR COTTON:

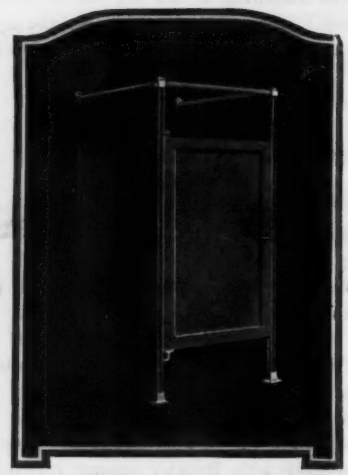
Some time ago, in a letter, I mentioned two new devices. One was a new attachment on a ring frame to make a longer bobbin—but I now believe this is a failure. The labor and the cost of the device would be as expensive as a new frame, almost, and then it doesn't increase the strength of the yarn.

But I believe the Bramwell feed is a success without a doubt. This device is being given added interest because of the fact that it is probably the method that Henry Ford will utilize in his new cotton mill, in which the picking processes will be eliminated and the stock delivered automatically from the vertical openers to the back of the card.

It is pointed out that "the function of an automatic feeder is to supply stock uniformly to the cards, and the most vital part of a feeder is the weighing device." However, to my mind a more important factor is the formation of the stock on the feed apron dropped from the scale. Is it not fair to assume that nine out of ten practical men would get the idea that the tufts scatter and cause the sheet it is supposed to form to be uneven in spots?

The present up-to-date Bramwell feeder has many advantages over our present carding system. In the first place, it eliminates the pickers. Then a card equipped with this feeder can be fed automatically from the bale breaker, thus requiring only one man to feed the breaker. A more accurate production can be obtained for the reason that the weighing is always exact.

This new feeder consists of a lifting apron, driven at a higher speed than that of other Bramwell type feeders, and the spikes are short. This is of great advantage, because it loosens all the tufts before dropping the stock into the



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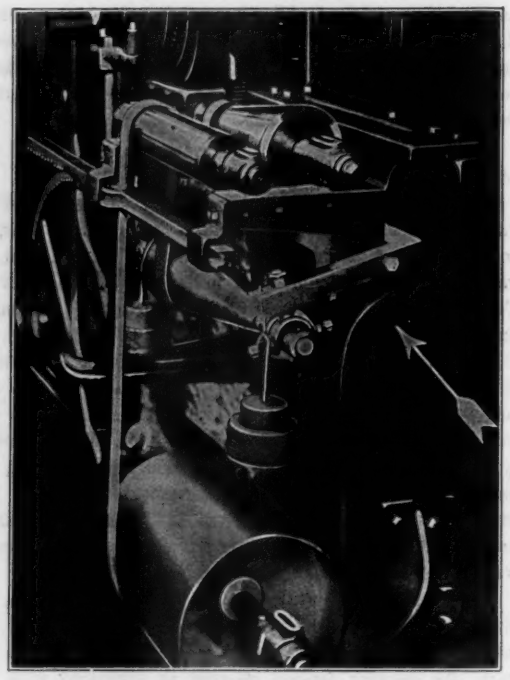

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scale. When the right amount of stock is fed in, it operates the scale and the feeding automatically ceases, the shutters automatically open and the stock falls on the feed apron. It is surprising how evenly the stock is distributed on the feed apron. However, to make sure that the feed is uniform, a push-board joins the last dropping to the preceding one, thus eliminating the possibility of holes forming here and there on the sheet.

Then a condenser immediately condenses the droppings, which completes the formation of the sheet before entering the feed rolls.

The feed rolls are constructed on the same lines as the licker-in, that is, the fillet is saw-toothed, but shorter, and arranged spirally the same as on the licker-in. This feature may be overlooked or disregarded by some mill men, but I think the inventor has hit the right idea. It will be recalled that I have often pointed out in the "How Other Men Manage" department how the stock is injured owing to the bite of the feed plate on it. With this feeder the stock is drawn without injury.

Wash (R. I.)

What Inserts the Twist on a Ring Frame?

EDITOR COTTON:

In the discussion of whether the traveler or spindle inserts the twist, the opinions are so different that I wonder what "L. R. M.," the inquirer, thinks of it all.

"Wash" says that the spindle puts in or inserts the twist, and I believe he is so convinced that he will need showing. He also says you can ignore the traveler, making reference to mule-spinning. You cannot ignore the traveler, and to compare the twist as put on in ring spinning with the method as used on a mule is not fair to the student. I say this in all frankness to "Wash," whom I admire.

On the mule the yarn is held at the nip of the roll and the spindle point. Each time the spindle revolves, one turn of twist is inserted. The yarn on the ring frame is held at the nip of the roll and the traveler. Each revolution the traveler makes around the ring, one turn of twist is inserted and not one turn for every revolution of the spindle.

Listen! The spindle does not give motion to the traveler. How's that? Because the traveler *derives* its motion from the spindle through the yarn being in contact with the spindle or bobbin. Why is it that less twist is put in the yarn as the bobbin increases in size? Because the traveler is not making as many revolutions around the spindle or bobbin when the bobbin is full as it does when the bobbin is empty or small. Doesn't this prove that the twist is inserted by the traveler because it derives its motion from the spindle and is not driven by the spindle as many would have us believe? Christy (Mass.)

EDITOR COTTON:

I wish to give my views on which inserts the twist on ring spinning frames, the spindle or the traveler.

In my mind there is no doubt that the spindle inserts the twist. If the readers will take a look at the gearing in the head of the frame, he will see that a change in the twist gear will alter the speed one way or another, and the change will alter the speed of the cylinder, changing the speed of the band and also the speed of the spindle.

Here is a little rule: R.p.m of driving shaft × diameter of pulley on shaft, divided by the diameter of the pulley on the cylinder, equals the r.p.m. of the cylinder.

Then the r.p.m. of the cylinder and driving gears, divided by the driven gears, will give the r.p.m. of the front roll. Then the r.p.m. of the front roll times the diameter of the cylinder, divided by the diameter of the whirl, will give the r.p.m. of the spindle. Here it is customary to allow five per cent for slippage in bands. Then find out what the front roll will deliver per minute, and this divided by the diameter of the bobbin times 3.1416 will give the r.p.m. of the bobbin.

Then the r.p.m. of the bobbin subtracted from the r.p.m. of the spindle will give the r.p.m. of the traveler. Take the r.p.m. and subtract from the r.p.m. of the spindle—and it will show that the spindle inserts the twist. Our little rule now shows that the front roll will not deliver as fast as the spindle will turn, so owing to the excessive speed of the spindle, it inserts the twist. J. F. C. (R. I.)

Simple Rules for Successful Management.

EDITOR COTTON:

I will give you in this letter some of the traits that in my opinion are essential to the making of a good overseer or superintendent in a cotton mill. When I say a good overseer or superintendent I mean one who makes money for the company and at the same time is liked by the majority of his help. He must, first of all, be a man who knows his job, both theoretically and practically. He must "be himself" at all times. He just can't know his help at and around the mill and then not know them when he meets them in town on Saturdays and Sundays. He can't afford to drive past some of his employees with an empty car and not ask them to ride if they are going his way. He must be a man who knows people and studies human nature. You can't treat all people alike. You can treat all people right, but you can't use the same method with all folks. I believe if there is any one method that comes nearer than anything else to fitting every person it is *kindness*.

Kindness and firmness are both essential to managing help. I don't believe there is a better rule to adopt in managing cotton mill help than the Golden Rule, "Do unto others as ye would have others do unto you." Some people have an idea that cotton mill help are ignorant and that you can pull anything over them. I will admit that up to a few years ago the average cotton mill worker was ignorant so far as book-learning was concerned. But they have always had about as much good common sense as any set of working people. They know when they are getting a fair deal.

Cotton mill people, to my mind, spend more money for eating, dressing and housefurnishing than most any other working class. Our people need education along the lines of economy, and the overseers and superintendents are the men best suited for that task. An overseer or a superintendent who is liked by his help can do more with them than anyone else. But in order for a man to secure this confidence, he must be one of them not only six days a week but seven days a week; not only in the mill town, but also in the city; not only when he is with them but when

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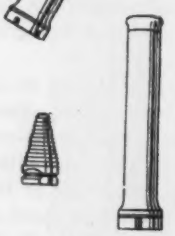

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he is with people who count themselves of a higher rank.

The successful overseer or superintendent must be a man of refinement and intelligence. He must not be bigoted nor stuck on himself. That doesn't mean that he has to go around and indulge in all the things his help does, not by any means. He must be a man who is interested in the people of the town and one who looks after their interests. In other words, he is a contact man between the officials and the help. He should be a man with convictions; not afraid to speak either for the company or for the help as his judgment guides him. He should not feel himself any better, humanly speaking, than any person who works for him.

These characteristics in our overseers and superintendents are more noticeable than they were several years ago. And a continuance of their influence will go a long way toward bringing about a better feeling and understanding between employer and employee.

L. J. S. (S. C.)

Skewers and Their Relation to Good Work.

EDITOR COTTON:

Every mill man does not thoroughly realize the value of skewers and their relation to the manufacturing game. Throughout the mill, especially in the carding and spinning departments and the warping room, thousands of skewers are used constantly. They are used first on the pickers and the carding machines in the form of lap sticks. They come into service again on the first and second intermediates, fly frames, jacks and spinning frame, and also on the twisters, sometimes. They are also used extensively on the warpers.

Faulty skewers are the cause of much more bad work than is generally realized. Strange as it may seem, skewers may make poor work even in starting a new mill—because they are new and not "broken-in," or seasoned, as it were. There are crooked ones and blunt-pointed ones. Skewers run best when they have been tested and sorted out and in operation for a few months.

There are numerous defects that decidedly affect skewers for the worse and thus cause several kinds of bad work. And yet many mills never or rarely ever look after the skewers to see if there is anything the matter with them. A great deal of bad work can and is quite generally made by defective skewers, or by some other defects which directly affect the perfect operating conditions connected with the skewers. Carders, spinners, warpers, all, should carefully examine their skewers to see that they have them as perfect as possible, and as perfect conditions in connection therewith as possible.

Considering some of the defects from skewers and the difficulties engendered by each, there are, for example, skewers that are too small to fit the bobbins or spools, causing the roving or yarn to be unwound unevenly. The ends will unwind by fits and starts, causing uneven work. On the other hand, skewers that are too large cannot be creeled rapidly and thus increase the labor problem.

Skewers which are too short fall out of the creels and tear down the work in process. While skewers that are too long protrude beyond the holes in the creel and oftentimes surplus roving which is placed on the creel will rest on the top of the skewers and prevent their turning. This in turn breaks the ends or causes single roving and waste.

Blunt-pointed skewers have been the cause of much bad work. They do not turn easily and cause stretched roving, thus making uneven yarns. Or else the ends are broken on account of the severe dragging by the skewer. This trouble will also be caused by waste, grit or other foreign matter becoming lodged in the creel step where the skewer should have free course. Over-worn skewer points, cracked creel steps, steps out of place or dirty and sticky will cause bad work.

When skewers are too small, or are crooked, or out of true, they will wabble and deliver long and short, making bad work. On the other hand skewers that are too sharp pointed will quite frequently overspeed and even "run away," causing breaks and waste.

Waste-bound skewers are quite frequent occurrences. This is caused by waste getting into the step and working under the skewer point, causing a drag. Waste sometimes gets into the creel hole in which the skewer fits at the top, which either puts a brake motion on the skewer or stops it entirely.

Shaky creels, vibrating floors, and vibrating unbalanced machines have a very bad effect on all skewers. They will often bounce out of the steps or shake out of place.

Leaning skewers caused by creels that are one-sided and not properly centered, or registered in line, will not unwind evenly.

The rod over which the roving must pass as it unwinds from the bobbin which is held in place by the skewer, plays a very important part in the service rendered by the skewer. If this rod is too high or too low, or too near or too far away from the bobbin, the unwinding conditions will not be perfect. The ends will sag and be stretched or "run away" and make waste. On account of the above conditions, some spinning rooms are often found in the morning with the roving having self-unwound and laying in great piles on the creel. The long stretch of the roving from the bobbin down to the roll, creates a self-weighting problem and causes the roving to automatically unwind in the night or at any time when the machines are idle.

The foregoing may also be caused by having the skewers too high above the bite of the rolls.

Therefore it can be seen that it does not pay to overload the neglected skewers. They are an important link in the chain of manufacturing devices, and they should be carefully inspected and properly cared for.

On the warpers where iron skewers are used, or where they have become over-worn and are of varying sizes, it will pay to buy a new set of wooden ones. They should be soaked in oil over night and then be wiped before being put into the service. As a rule iron skewers are too heavy for warpers.

On the warpers, it is very important that the skewers fit the spools very closely, to prevent the serious defect of having the spools climb. When skewers are over-worn or too small, the spool hangs below its own center. Therefore, in order to unwind, the yarn must not only pull the spool over, but it must also pull a loaded spool which must be dragged upon the skewer, or the spool must be lifted. This is a very common fault in many warping departments. Any warping department may greatly improve the conditions by installing a new set of skewers. Skewers which cause a drag on the yarn, or interfere in any way with the

proper unwinding of the yarn will strain and destroy the much needed elasticity of the yarn for the weaving department.

Enough has been said about skewers to lead any progressive mill man to appreciate that the skewer is of much more importance than is often realized. In an ordinary mill of fifty thousand spindles, there will be upwards of five hundred thousand skewers in operation. Each having two bearings. This means altogether a million points upon which depend, in a large measure, the successful operations of cotton manufacturing. And as no article has ever appeared exclusively devoted to this one particular phase of cotton manufacturing conditions, this paper is offered for the kind attention of progressive mill men.

H. D. M. (Ga.)

Is a Drawing-in Machine or a Tying-in Machine Better for This Work?

EDITOR COTTON:

I would like to see discussed in the "How Other Men Manage" department whether it is better to use the drawing-in machine or the tying-in machine on flat ducks, drills and osnaburgs; and would like for those answering to give the reasons for their preference.

G. E. B. (Texas.)

Twist in Yarn.

EDITOR COTTON:

The age-old discussion of what inserts the twist in spinning and plying yarns has been revived. It is true that both the spindle and the traveler are important, and this discussion is similar to one based on whether the top flats or the cylinder of a card is responsible for the carding effect. Both are used, and both are necessary; the same is true with the spindle and the traveler.

The supporters of the spindle will ever find retreat in the fact that the spindle is the means of driving power, and so is responsible for the twist being placed in the yarn. Of course, this is quite true, but the spindle is used more for wrapping the yarn on the bobbin, as the bobbin follows every revolution of the spindle. The yarn is wrapped onto the bobbin in the same direction that the spindle is moving, and is in a direct line at right angles to the line of the spindle; so, from this standpoint, I do not see how the spindle can be held responsible.

I do not deny that twist is inserted in yarn after it has passed through the traveler, but am to be convinced that this is true in this case. As I see it all the twist is put in between the traveler and the bite of the front rolls. Everyone agrees that there are not as many turns of twist put in the yarn per inch for every revolution the spindle makes to an inch of yarn produced by the front roll. To be more clear, if the spindle revolves exactly 15 times while one inch is coming from the front roll, then not quite 15 turns are put into that one inch of yarn; especially is this true when the bobbin is nearly filled.

As though you were feeling the tension of the yarn on a ring twister, pull the yarn up with the finger. While you are doing this, twist will continually be placed in the yarn although no yarn is going onto the bobbin or its carrier, the spindle. The yarn can also be gripped firmly with the thumb and finger, and pulled off the spindle, the same having its regular motion, and twist will be inserted in the yarn between the traveler and the fingers. This proves that the traveler is the important part in twisting, for twist is put in while the yarn is being wrapped on the bobbin, or being pulled off, which shows the spindle does not affect the twist in any way.

I believe the foregoing, while admitting the spindle gives the twisting power which the traveler holds.

Some contributors have offered the idea that yarn is spun on mule frames where no travelers are used. This is an entirely different machine, employing two processes, twisting, which goes with the outward run of the carriage, and winding, which follows the ingoing run. I, therefore, cannot see where the mule spinning frame throws any light upon this discussion.

L. R. M. (Ga.)

Answers Questions on Drawing.

EDITOR COTTON:

"Contributor No. 14," in the January issue, asks some questions about drawing frames that I will attempt to answer.

First, I want to be frank and say that I would discharge any man who would even attempt to repair metallic rolls. Again, any man who understands metallic rolls will not attempt to repair them. It can't be done in any mill.

I suggest that a cause for the slack web that "Contributor No. 14" has, might be that someone has filed or used emery cloth on the collars, which would increase the depth of the meshing and of course make a slack web. I further suggest that he try this: Swap the rolls from one sliver to another, that is, those which cause the slackest web should be all placed on the same head. They should be turned also so as to form the best web. Then the calender gear should be made a tooth smaller.

"Contributor No. 14" is wrong when he says, "It is often hard to break away from established methods." It is the easiest thing in the world. Do you remember that we had only three doublings on our first drawing frames? Then four, and then six. I have run ten doublings. However, it is not always possible to run a large number of doublings for the reason that the draft on the drawing must not exceed 6, which calls for a very light card sliver. Of course, if a man has more cards than necessary, he should by all means have his guides bored and run eight slivers if possible. The more the better—without an excessive draft.

It will be remembered that some thirty years ago our mill engineers conceived the idea that one card to two deliveries of drawing was an excellent hang-up. Next, we had one card to 1½ deliveries, and now the best hang-up is one card to each delivery of drawing.

I may be wrong, but I firmly believe that the time is not far off when we will see two cards to each delivery, with a very light card sliver with increased doublings on the drawing and the second intermediate frames eliminated. That would be the ideal hang-up. Every carder agrees that the strength of the yarn is in the stock and the doublings. We double at every opportunity for that reason.

As regards the speeds of drawing frame rollers on a 46-grain card sliver, producing a 53-grain finished sliver for slubbers—asked by Contributor No. 14—if he has his rolls set properly, a speed of 400 r. p. m. should give good re-

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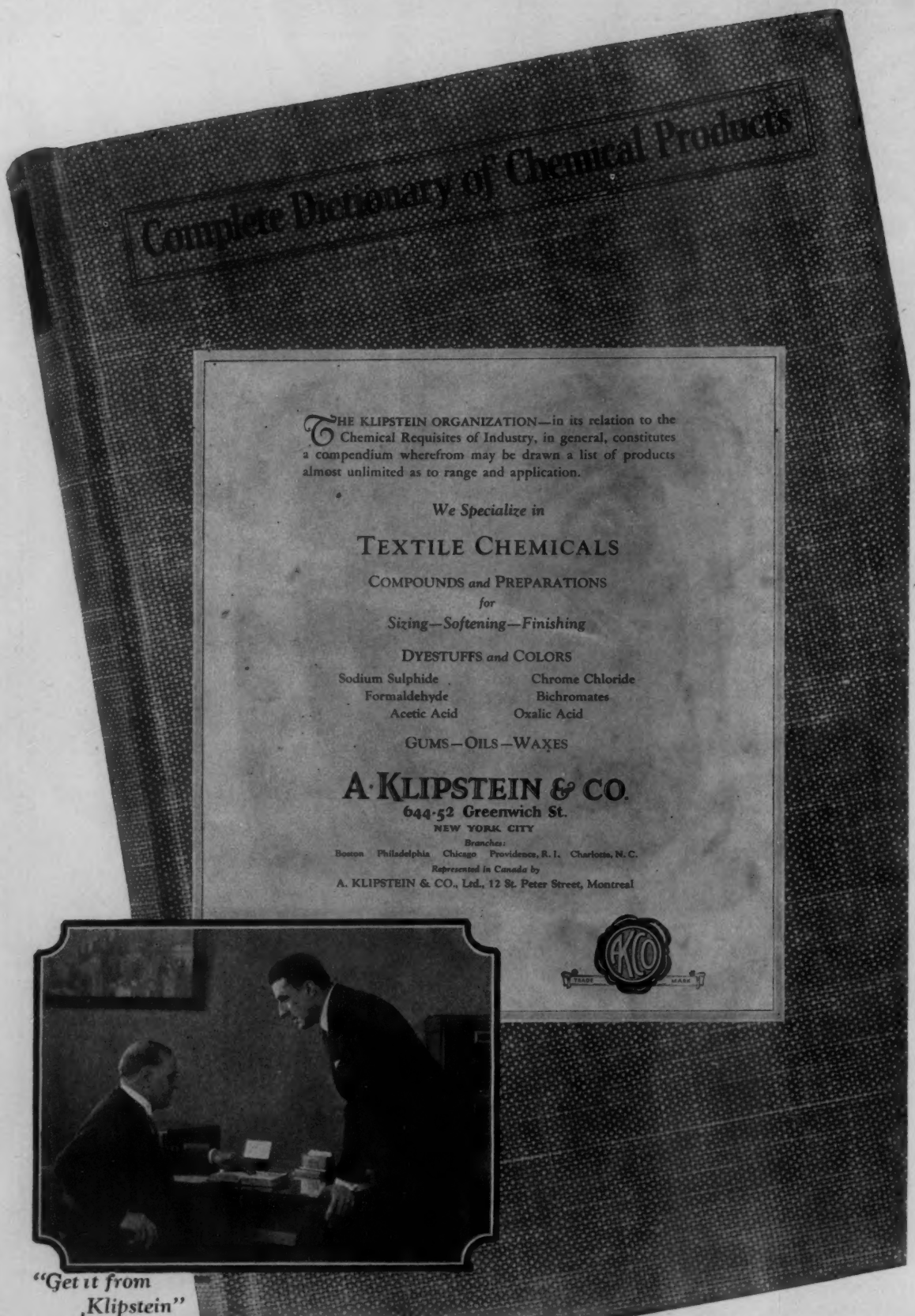
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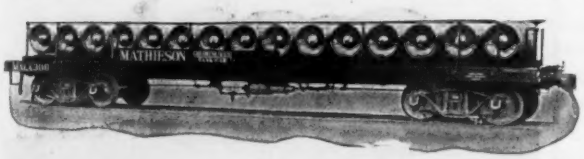
sults. However, he should be sure that the rolls are spread center to center so as to exceed the length of the staple run by ¼ of an inch. Wash (R. I.)

Mathieson Chlorine Tank Car Approved.

The Mathieson multi-unit chlorine gas tank car, designed and operated by the Mathieson Alkali Works, Inc., as shown in the illustration, is held entitled to the same freight rates and privileges as any tank car, by decision of the Interstate Commerce Commission, it is announced. When the Mathieson company voluntarily designed and placed in service this multi-unit car over two years ago, it is explained, the railroads held that it was not a tank car, and endeavored to assess charges far in excess of those applying on the Class V tank car. In the interest of both producer and consumer, the Mathieson company appealed to the



Interstate Commerce Commission that this discrimination be removed, that the industry might be able, economically, to use this equipment. The decision of the Commission, it is pointed out, completely upholds the contentions of the Mathieson company and the safety-first principles embodied in the car design.

More Service to South.

Following the recent establishment of a branch office in the Woodside Building, Greenville, S. C., the H. W. Butterworth & Sons Company, manufacturers of textile finishing machinery, with home office in Philadelphia, has taken over the plant of the Greenville Iron Works, Inc., at Greenville, and will operate it as a branch plant.

This new southern acquisition consists of a completely fitted up foundry and machine shop, fronting on the C. & G. divisions of the Southern Railroad. Its equipment includes the latest type lathes, planers, milling machines, drill presses, as well as a shaper, forge and various small power appliances. A complete tool room is included. In addition to full foundry equipment, there is also a blacksmith shop, capable of meeting the needs of the combined foundry and machine shop. The motive power is electrical throughout. A completely fitted up office is also included.

Speaking of taking over the Greenville plant, Harry W. Butterworth, president of the company, said, "We believe that the growth of the textile industry in the South warrants our placing an organization and plant there. We came to this conclusion speedily after having opened a branch office in the Woodside Building. This is under the direction of J. Ebert Butterworth, treasurer of the company. Our principal idea is to give the South more and more service. The South cannot move up to us, but we can and have come to the South.

"At first, the work of the Greenville plant will be confined chiefly to the making of minor parts, repairs, and the refilling of rolls. In the latter item alone, considerable haulage expense will be eliminated while weeks of what is often valuable time will be saved. Of course, as fast as it can, the new plant will take over other lines of work. Whether or not, however, we will eventually enlarge our Greenville plant to handle the work of the entire southern territory, will depend largely upon the need that is shown for the larger plant."

Staley Has New Sales Manager.

Edwin K. Scheiter has become general sales manager of the A. E. Staley Manufacturing Company, Decatur, Illinois, which manufactures Staley's Eclipse mill starch and other products for textile use.

Mr. Scheiter has been with the Staley company for five years, the last year of which he served as manager of the starch sales department. His appointment as general sales manager came when Mr. Staley, head of the company, decided to withdraw from the active administration.

The new sales manager is the youngest man, in actual years, who has ever held this position with the Staley company. He is a native of Decatur, and in the early part of his business experience, following his school education, he became associated with the Staley organization, going there to install a cost accounting system for the new factory. After four years of service in the general office he was placed in charge of starch sales, and his ability as demonstrated in that position proved his capacity for the new place which he now holds.

During the year that Mr. Scheiter was in charge of the starch sales, the sales department developed until a change from the old plan of management was necessary. When J. L. Anderson came to the company as general sales manager, that department was divided into three divisions. After Mr. Anderson's death the three men in charge of these divisions acted as a committee in charge of all sales, with Mr. Staley as the head of the department. The three men who thus served were R. M. Ives, in charge of glucose and sugar sales; E. W. Martin, feed and oils, and E. K. Schieter, starches. The first of this year, Mr. Staley decided to retire from active management and Mr. Scheiter was named to assume charge of sales. The position of manager of starch sales has been taken by H. T. Morris, who has for some time been Mr. Scheiter's assistant.

A southern office of Stockton Commission Co., Inc., selling agents for cotton mills, 100 Worth Street, New York City, will be opened at Charlotte, North Carolina, it is announced by Frank W. Gurry, who will be in charge of the Charlotte branch. It is planned not only to offer sales service to the southern mills, but to have a staff of practical technical men ready to go into and revamp any cotton mill without cost to the mill, it is announced.

Saco-Lowell Shops announce that their executive offices, foreign, northern cotton and worsted sales departments, are now located at 1 Federal Street, Boston, Mass. The new address became effective on March 1st.

J. F. LOCKEY has become superintendent of the Liberty Cotton Mills, Clayton, N. C. He was formerly at St. Pauls, N. C.

C. R. HUGHES has become overseer of spinning at the Cascade Mills, Mooresville, N. C.

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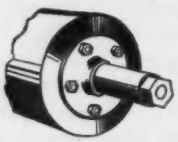

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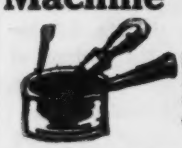

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Some Factors to Be Considered in Styling Cotton Prints.

(*Continued from page* 462.)

field for the man with nerve, and it is beginning to be demonstrated with disquieting effect in unexpected places. Fear of the outcome of change is not a reasonable basis for the "stand-pat" attitude here; it is just as reasonable to fear to stand, judging by some of the effects seen.

My attention was called, some time ago, to window displays, in one city, covering several blocks of the shopping section. The dominant color note was such as to move one to go, in all charity, to the merchants and plead with them to reconsider their affrontery to public taste. The proof of the matter? Six months later these feature colors (the self-same lots of goods) were either on bargain tables or hidden, with regard to proper pride in the reputation of the stores.

Recently a well-known observer in the foreign markets, that admitted by presage the style trends in certain lines here, gave as his carefully developed and checked opinion that color was the most important feature in cut of clothes and that it displaced and outranked all other considerations. And as for decorative materials—but ask any professional decorator, or any woman whose home is a decorative achievement.

If we will but investigate and admit our findings truthfully we all know that proper choice and styling of color markedly influences sales value.

Or if further evidence is needed to support the opinion, examine the progress made in the sale of mixed paints since definite attention was paid to that feature, or still better, the growth in power and book-value of advertising since advertising men sought to become color-specialists.

In styling, as in all the other important professional activities, the time has arrived for the application of exact collected knowledge in the place of guesses of buyers. The buyer is the very last person in the world to be expected to be an expert in the elements and ensemble of this matter of color. It is just as reasonable to expect a skillful strategist to be an expert on high explosives, just because he happens to be a soldier.

Considerable amusement was occasioned last year by the buyer who mailed to the home office from Paris a snapshot of himself taking local refreshment at a sidewalk cafe, and the label "This is how I am spending your time." It drew plenty of thoughtless (and some envious) comments. After all, local color is a major background of style and my guess would be that that buyer was developing his special knowledge in observing elements like color and line so as to round out his strategy of buying technique. The buyer is primarily a strategist—and the individual (purchaser) a competitive one. Concentrate the strategic ability of the organization upon that problem and derive the special data from procedure such as outlined above.

Science, art and psychology have advanced tremendously of late and their influence is felt by every individual. Purely as a problem of merchandising, the closest and most complete possible application of the discoveries made in these specialties should be made to the manufacture of articles offered to a more enlightened public. Do not insult people any further with the printed atrocities current from 1919 to the present unless you do not worry about diminishing profits.

Despite propaganda and art societies subsidized by manufacturers who have no central creative motive,—in motifs used, in textures, finishes, and most of all in colors and their treatment, a strongly buying public wants certain definite things, and will have them, in spite of advertising, in spite of tariff, and in spite of presumptuous salesmen. Consider the number of people who visited Europe this year and the potential as well as the actual market they represent. A properly styled line sells, and outweighs lines the colors and other features of which are chosen arbitrarily.

Human Relationships in Industry.

(*Continued from page* 468.)

sion of this subject is so long and involved that it is not advisable to enter upon it here, but in a later isue an entire artiele will be devoted to the "teaching process."

As a laboratory exercise it will prove interesting to detail certain pieces of information that it is necessary for a new employee to have and then select some member of the group to instruct another. The other members should make notes and criticisms of the methods used, and the success attained. If a real test is desired, the leader can get someone outside the group who really has no idea, or, if any, a hazy idea of the subject to be taught, and bring him in before the group and delegate a member to instruct him. Here are eight admonitions, and I close this part of the discussion. (1) Create in the mind of the student a need for the information you are about to give. (2) Bring him up to the proper mental state by preparing a proper background for understanding. (3) Talk in terms that the student can understand. (4) Don't try to teach too much at one time. (5) Take plenty of time. (6) Test all results. (7) Analyze your methods. (8) Don't give up. Nothing is impossible.

The last phase of the instructing subdivision is,—Who shall be charged with the responsibility of instructing new help. My experience has been that there is no one in particular responsible. New help is started to work and gradually he acquires the information necessary to enable him to get along. It may be a costly process. It may cost him his job. It may cost the overseer or superintendent an extra amount of worry and supervision, it may cost the management in decreased production, increased seconds and waste, and wear and tear of machinery. Who is responsible? Everybody. Who is everybody? Nobody. Responsibility can not be placed, hence confusion comes and cooperation goes. I can not suggest who should give this instruction. Conditions and types of people in executive positions determine that. Someone who is a good instructor should do it. If the overseer is capable and so desires, he can do it; if he desires for someone else to do it, he should choose wisely this important man and charge him specifically with this responsibility. He can then place responsibilty. The reader may have decided that I am giving a great deal of space to a subject of minor importance, but to my mind an overseer's job naturally divides into three parts, (1) Executive; (2) Supervisory; (3) Instructional. If this is true, I have only slightly touched upon one of his big duties.

Below, I submit a few reasons for placing stress upon instruction:

1. Ten times as many accidents occur among new employees as among those who have been employed six months or more.

2. The labor turnover among new employees is several times greater than it is among older ones.

3. The percentage of spoiled work.

4. The value in cultivating the right attitude in the new help.

5. The production demand.

6. The general economic value.

7. Progress is dependent upon growth, and growth is dependent upon instruction.

If the instruction process has been complete, the new employee has been properly assigned to his task and a clear understanding of his responsibilities has been given him.

He understands to whom he is responsible and for what he is responsible. He should meet and know these people and feel that they expect to cooperate with him and he must cooperate with them.

He must be made to feel free to call upon the proper people for suggestions and information. He must feel that any inspectional or follow up visits that you make to him are not with the idea of spying or trying to find fault, but for advice and suggestions that will be of value to him in the successful execution of his job. To state in one sentence the entire purpose of the induction process is to state that we want to impress upon the new applicant the fact that we are good people to work for, we will do all in our power to help him make good, we want him to make good, and if he does not make good it will not be our fault. We are able to work with other people in a happy, harmonious, productive way. He must be able to do the same.

A man well hired, well instructed, and well placed, is an asset to any organization.

Fall River Men Discuss Weave Room.

(*Continued from page* 476.)

would be 53 inches, 128 ends per inch, 13s yarn and 64 picks, 9s filling average 1.07. If the mill is run three shifts of 48 hours per week this would equal 29,000 pounds $\times$ 3 = 87,000 pounds of yarn. The looms are said to be automatic and if they are run at 190 picks per minute, 120 hours per week, they will produce 118,750 yards or will consume practically 120,000 pounds for 120 hours against 87,000 pounds yarn for 144 hours.

"It does not appear to me that the process has been carried far enough."

Again taking up his explanations, Mr. Hays said, "Here are three samples of pile fabrics, a corduroy and velveteen, these being filling piles, and a velvet which is a warp pile. The corduroys and velveteens are both high pick goods and it is very essential that the cloth be woven without any wrong draws particularly in the case of corduroy when the pile is cut by machinery."

A man asked if velveteen can be cut by machinery. "No, you cannot cut velveteen by machines but you can cut corduroy," said Mr. Hays. "When a weaver makes a wrong draw the race will be cut through and that piece of cloth is spoiled and must be cut out."

"How about weaving velvet double and when cutting cloth to cut in between the two? Is that a success?" was next asked.

"That is the way in which this velvet sample is woven; one above and one below and interlacing the warp through," was the reply.

"On automatic loom with high take-up roll and with cast gears, do you have much trouble in getting an even pick?" someone asked.

"I do not see why you should have. Do you mean even number of picks per inch and do you use worm gear? If so, you should not have."

The member of the audience said, "It has been my experience that cast gears are not true as to the circle and distance of each tooth; also when bored the hole will not be in the true center which causes an eccentric and takes the cloth down more on one side than the other thus putting in less picks or threads across the cloth per inch in one place than another. For example, when counting the picks with a pick glass, if 36 picks were desired one would probably find there were either 34 or 38, whereas a cut gear being absolutely true will take the cloth down even and count 36 in every place."

"I agree with this last speaker," said another man. "In the mill where I work we had the difficulty he mentions, not being able to get the exact number of picks, and after much investigating found the trouble due to the use of cast gears. We now use the cut gears."

The next question was "I would like to ask if any of you weavers have had trouble with your cloth varying in width from one hour to another. I believe that where the cloth varies in width, you will find it varies in picks. I have had experience with cloth varying ¾ inch from 11 o'clock to 1:30 o'clock. The conditions were rather unusual, very high sley and high pick."

"The only answer you could give is that in all probability the weather caused it."

The last question was: "Could you tell me how many thin places would be passable in a cut of one hundred yards of five-harness sateen?"

"It all depends upon the market," was the answer. "If the cloth is in demand and there is a scarcity you might be able to pass even up to one dozen. If not, it probably would be rejected with less than three thin places. It is better not to take the risk; to have all goods shipped out first class in every respect."

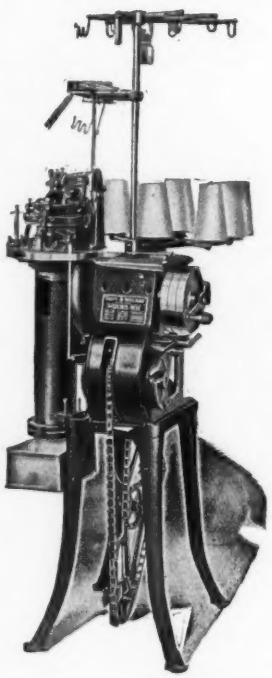
This concluded the discussion and the meeting was adjourned.

The sales arrangement between the Michigan Alkali Company and Edward Hill's Son & Company having been terminated, the personnel which directed the distribution of Wyandotte soda ash, caustic soda and bicarbonate of soda, will continue to do so for the Michigan Alkali Company. Selling headquarters in New York will be known as the general sales department of the Michigan Alkali Company, 21 East 40th Street. E. M. Taylor is director of sales of the Michigan Alkali Company. The attention of Edward Hill's Son & Company will be focused on their other products, antimony metal, antimony oxide, citronella, timonox and arsenic.

KNITTING SECTION

NEW MODEL H-H

Producing Ribbed Top Half Hose Complete



Ribbed top made on two sets of needles.

Automatic transfer from ribbed stitch to plain.

Eliminating necessity of skilled help.

Saving of raveling waste which occurs when topped by hand.

Each stocking is dropped from the machine when finished.

Each stocking is automatically started upon the empty needles, producing a French welt without drawing thread or cutting, no ends of any kind to be removed.

Machine is fitted with five yarn fingers.

Provision is made for high spliced heel and double sole.

Provision is made for ring top and ring toe.

Needles without rivets or latches.

Speed of machine about the same as Model K.

Production about twelve stockings per hour on 3¾" 220 needles.

One operator can take care of the same number of machines as Model K.

The machine is built in all gauges.

ESTABLISHED 1865

SCOTT & WILLIAMS

INCORPORATED

366 Broadway **New York**

Hamilton, Ont.
Main and McNab Streets

High Point, N. C.
401 Wachovia Building

The
One Millionth Telephone
And
Quissett Quality Yarns

The one millionth telephone of the New England Telephone & Telegraph Company has recently been installed in New Bedford—in the home of a cotton mill operative. The New Bedford operatives enjoy every advantage of working and living conditions. They are high paid operatives, earning good wages with steady employment—the pick of cotton mill operatives of the United States. More quality cotton yarn is made in New Bedford than in any other city of the country. The outstanding cotton yarn mill in New Bedford so far as quality is concerned is the Quissett Mill—located in New Bedford to take advantage of the quality operatives, the fine manufacturing possibilities due to climatic conditions unequalled by any other cotton manufacturing city of the United States and the excellent shipping facilities of this great seaport and railroad center.

Quissett quality never varies—the mill was founded on the basis of quality approaching perfection and our business is solicited on the quality foundation.

We are glad to co-operate with cotton yarn users and a thorough co-operation between us and the buyer to insure production of the best yarns for the buyer's particular purposes.

Carded and Combed Cotton Yarns in all Numbers and Descriptions.
Ply Yarns our Specialty.
Egyptians, Sea Island, Peelers, Sakelarides.

Quissett Mill
New Bedford, Mass.

Wm. M. Butler, President, Edward H. Cook, Treasurer, Thos. F. Glennon, Agent

QUISSETT MEANS QUALITY

We invite our readers to make use of this department for the discussion of any and all problems arising in connection with the knitting mill from the office to the packing and shipping departments. Questions, answers or letters need not conform to any particular style and will be properly edited before publishing. All questions will be answered as promptly as possible. The names and addresses of the contributors must be given, but will be held in confidence and a pen name substituted when printed. All accepted contributions other than questions will be paid for after publication. The editors do not hold themselves responsible for any statements of opinion or fact which may appear in this department unless so endorsed. This department is open to all.

Setting Standards for Piece Work.

EDITOR COTTON:

I was very much interested in the article by Mr. Shive on "The Stopwatch a Necessity in the Knitted Underwear Industry," which appeared in the Knitting Section of the January number of COTTON, and should like to submit the following questions for Mr. Shive's reply:

When you time the ordinary operator, on whom the standards for piece work are set, do you find that there are several operators, who are much more speedy, running away with the piece work standard set, and others that are slower who are not able to make a living wage on the piece rate set by the stop watch?

What constitutes the 20 per cent you add to the actual seconds of timings? Do you find this percentage a fair allowance for all operations?

Kindly mail me a blank copy of your idea of an operation time study sheet to be used as a sample for the printer.

Cost Man (Mich.)

EDITOR COTTON:

In reply to the questions of "Cost Man" regarding my article in the January number—

When performance time studies are taken as a basis for establishing standards for the setting of piece work rates, the studies will be found to be more interesting if they are made on the extraordinary, the ordinary, and the under-ordinary worker, if taken upon one and the same operation. The variation in the recordings of the several performances are then easily explained and understandable.

In setting the standard times, it is possible that in one's good judgment he should use time of performance number one from the operator, performance number two from another operator, and performance number three from still another operator, or an average of the three, and if the standards are properly set there is absolutely no reason to imagine that one worker will run away with the piece work rate while a second operator will not be able to earn a living wage.

Any female operator when performing for the benefit of an experienced time study man will soon strike a gait in excess of her standard activity. Then when she is told of the wonderful production she is capable of, she will say, "But Mister, I couldn't work that speedy all day long." Then the man should explain the situation and let her work for two minutes and rest one-half minute, and then work four minutes and rest one minute. Finally, have her work steadily for forty-eight minutes and rest twelve minutes. The loafing time will now appear so great to her, you can easily make it understandable that the 20 per cent allowed for idleness makes it possible for her to rest twelve minutes in every hour, and still give the production desired.

Repeated examinations and tests lead me to feel that in a well organized sewing machine department an allowance of 20 per cent for idle time (necessary and unnecessary) is sufficient and seemingly fair. However, in such a department as outlined in my article—where the house is not put in order, possibly 33⅓ per cent of a working day is justly used up in idle time, and I do not consider this in the least a fault of the operator. It is hard work for an operator to wait for garments, or for her machine to be repaired or kept not running, or for her to travel several miles each day to and from her machine with heavy bundles of garments.

Edward Hoover Shive.

(Editor's Note.—A copy of Mr. Shive's original idea of an operation time study sheet has been forwarded this correspondent for his printer's use. Others will be sent to those applying to us.)

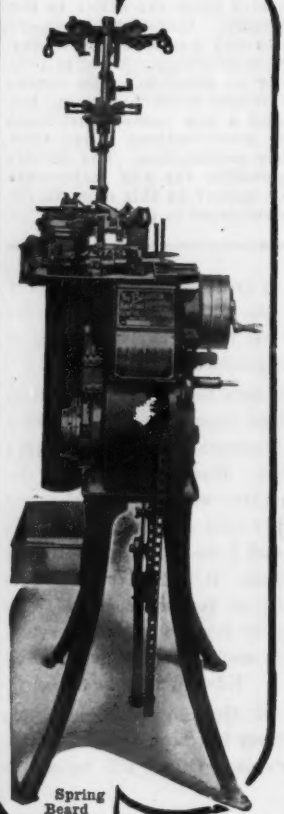
Contented Help Increases Production.

EDITOR COTTON:

We knitting mill managers and superintendents are so engrossed with the idea of turning out the greatest number of dozens possible, at the least cost, that we often forget the little comforts of our employees. We are careful enough to keep each knitting machine in good repair; we are always on the alert to obtain the highest class mechanics to work on the machines; and we never fail to have each machine thoroughly and properly lubricated. But what about the human machines?

You will notice that I said *little* comforts, and by this I do not mean such obvious things as reasonable wages and short working hours, modern homes or good living

The Banner Full Automatic Hosiery Machines



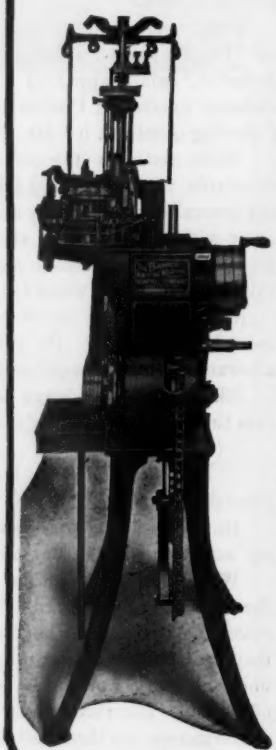
Spring Beard Needle Machine

Simplicity
Quality
Speed
Production

All Parts Accessible from the Front of Machine

We have just placed on the Market two new models– The Spring Beard Needle, built in sizes of 3" to 3 3-4" diameter, and a new model --Split Foot Machine, built in sizes of 3 1-4" and 3 1-2" diameter.

Write for descriptive catalog



Split Foot Machine

HEMPHILL COMPANY

MAIN OFFICE AND FACTORY PAWTUCKET RHODE ISLAND

TRADE MARK

SOUTHERN OFFICE and SHOW ROOMS 912 James Bldg. CHATTANOOGA, TENN.

PHILADELPHIA OFFICE and SHOW ROOMS 208-9-10 COLONIAL TRUST BL'DG. PHILADELPHIA, PA.

conditions in general, but I refer especially to the comfort of the individual looper or knitter during the ten or more hours that are spent in the mill.

Granting in the beginning that a modern plant is provided; and that we have all those conveniences mentioned in the foregoing paragraphs; granting that an abundance of light, ventilation, sanitary toilets, etc., are supplied; and that the discourteous, swearing, wrench-throwing foreman and fixer have no place in our organization—have we reached our goal?

I dare say that there are few hosiery mill superintendents who have not been confronted with the looper—for example—who was tired of looping and wanted to change to another job for a rest; or the topper who wanted to loop; or a pairer who would like to work in the knitting room for a change. Of course no sane man would recommend constantly changing from one job to another, at every whim of a dissatisfied worker. Better to dispense with the chronic kicker at once. There are times, however, when it is advisable to permit a change.

Our plan is to allow any girl to learn two different jobs. For instance, a looper who has a reasonable excuse for wishing to learn pairing, is given the opportunity to do so with the understanding that she, in turn, will teach a pairer to loop. It is, of course, up to her to find the pairer who is willing to make a change. In most instances she is not hard to find. The learning, for the most part, is done during the noon intermission and the ten or fifteen minutes spent in the mill before starting time in the mornings. It may require several weeks of reciprocal teaching to accomplish the desired results, but when it is done these two girls have the privilege of exchanging jobs at any time, provided, of course, that they both do satisfactory work and that they do not change oftener than once a month.

The advantages resulting from this method are (1) a rest from the monotony of continuously doing one thing; (2) better health, and (3) better feeling among the help, all of which combine to produce a better working force.

It is true that some may object to this plan on the ground that it is expensive, or that it causes a loss of production. The first objection may be met with the statement that there is no expense to the mill. And if it did cost a hundred dollars and saved one good employee it would certainly be worth the price.

Regarding the second objection, it is true that there is a slight loss of production for the first day or two after the change, due to the fact that the operatives are more or less "out of practice," but this is only temporary. On the other hand, the production will gain more than it loses, for with this method of changing jobs a great many efficient employees will be held who would otherwise quit or take a vacation.

Another criticism is sometimes heard that there is no necessity for a change in jobs, and that the desire to do so is a mere whim. We believe, however, that if the one who makes this criticism were compelled to sit or stand in one position for a few months and go through one set of operations continually, he would change his views in a short while.

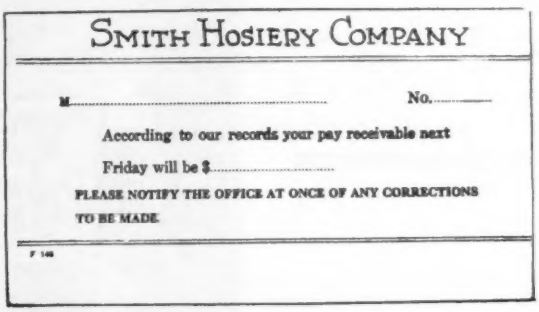
R. B. E. (S. C.)

Lockwood, Greene & Co., Inc., have announced the removal of their New York office to The Pershing Square Building, 100 East 42nd St., New York City.

An Interesting Pay Roll Kink.

EDITOR COTTON:

The accompanying form is a payroll voucher or pay notification which we have found to be very useful, and which may prove of interest to the readers of your department, "Knitting Kinks." This form is made out for each employee each week, showing the name, clock number and amount of money receivable. As soon as the amounts are


SMITH HOSIERY COMPANY

M..... No.....

According to our records your pay receivable next Friday will be $.....

PLEASE NOTIFY THE OFFICE AT ONCE OF ANY CORRECTIONS TO BE MADE.

available, Tuesdays ordinarily, these forms are sent out. When the use of this form was started there was a serious labor shortage. Payroll errors caused discontent and increased labor turnover. We found that these notifications before actual paying overcame this difficulty, improved the morale and were well worth while. It has proven to be one of those "little things" that sometimes mean so much to the final success of an organization.

A. G. J. (Mass.)

Bleaching Cotton Knit Underwear.

EDITOR COTTON:

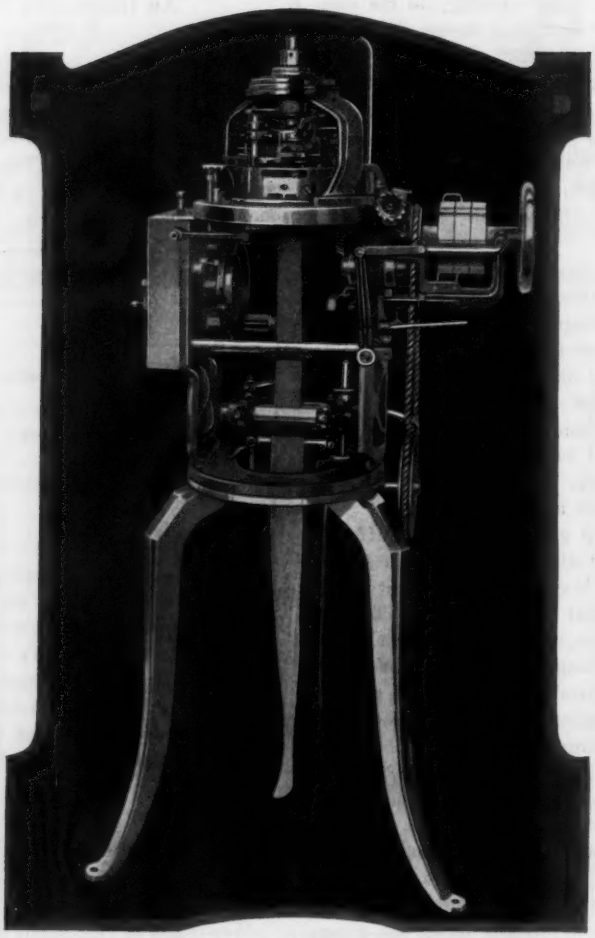
We are having complaints that our knit underwear (tubing) is not bleached soft enough. We are enclosing some samples. You will notice that we have tied two together—one pink and the other white. The white is done by a friend of ours in Canada (notice how soft it is). The pink is our bleaching (note the hardness of it). What we want to obtain in our fabric is softness.

We are using circulating kiers, pump and heater type, and six tight loop washing machines for the operations after the boiling. We chemic with liquid chlorine which we prepare in a large tank and run as required and circulate through one of the tight loop washers. When the machine starts we pump the bleaching liquor from the large tank into the machine, running it out at the other end and back into the mixing tank. In this way, the chemic is being constantly circulated. The goods are then allowed to air bleach in trucks for some hours and then washed, run through antichlor, washed and dried on the loop dryer. Will you please give me some information on this matter through the medium of your "Knitting Kinks" department?

C. M. (Ind.)

EDITOR COTTON:

I would say in answer to "C. M. (Ind.)," an advance copy of whose question was submitted to me, that in the bleaching of cotton knit underwear no set of fast rules can be laid down, as conditions will vary, not only in different bleaching plants but even from day to day in the same



Wildman Ribbing Machine

Wildman Circular Ribbers offer you the marked advantage of a two-speed drive.

The Wildman new style two-speed drive will operate at one speed for difficult stitches and at a speed two-thirds higher for plain knitting. As an illustration, a Wildman Ribber can be run at a speed of 100 revolutions per minute on welts and increased to 166 R.P.M. on plain stitches.

The change in speed is accomplished by the Wildman belt shifter mechanism, a decided improvement over a clutch.

On request we will send the "Wildman Ribber Catalogue" giving detailed illustrations and descriptions of every important part of the machine.

We have issued a very complete and informative book, "The Science of Knitting"—Price $3.00

TRADE MFG MARK

WILDMAN MFG. CO.

NORRISTOWN, PA.

establishment, and only the man directly in charge could know how to carry his bleaching processes so as to meet these existing conditions.

At least four results should be obtained in bleaching, namely: A cloth of uniform whiteness. A cloth of very soft feel. A cloth of life and elasticity. A cloth of good tensile strength.

With regard to the mechanical equipment, "C. M." appears to have about the right thing except that in place of the six tight loop washers he should have eleven. After the goods come from the kier, the most up-to-date method of treating them is the continuous system, for instance, the washing tanks should be set up in line (end to end) so that the cloth could, if necessary, be run continuously from one to the other through the whole line. The water box or tank of each washer should hold 350 gallons. The trucks into which the goods pass at the end of each operation should be so constructed that air can pass through the goods from all four sides. In the boiling it is always advisable to steep the goods overnight in hot water; to accomplish this, the goods are run through boiling water through two of the washers and the whole lot piled (in rope form) in a large pile, they lie in this overnight and the next day are washed through from one to three of the washing machines into the kier where they are boiled eight hours in a liquor containing two per cent caustic soda, one per cent soda ash and one-quarter per cent of silicate of soda. After the kier boil the liquor should be blown out and the goods thoroughly rinsed with cold water in the kier before it is opened so as to avoid any possibility of air stains which might otherwise develop on any part of the goods exposed directly to the air. I might say that the goods should be boiled at a pressure of 15 to 20 pounds.

The goods are then run out of the kier in rope form, through two of the washers containing rinse water which is continuously flowing. The object of these two rinse waters is to remove more of the boil-out liquor from the goods. The goods then pass (continuously) into another washer containing a hydrochloric acid sour which neutralizes the last trace of alkali which might still remain in the goods. It has been found that two quarts of 20 per cent acid will sour a truckload of goods sufficiently. After souring the goods are run into trucks or onto a pile and allowed to stand about half an hour. During this time the acid will neutralize any alkali which may remain in the goods and at the same time it has the tendency to whiten and soften them. After standing for half an hour the goods are washed through two washing machines to remove the acid, and passed directly through a third washer containing the bleaching liquor.

The bleaching liquor or chemic should stand about 1 degree Tw. or perhaps less and the goods are run through this into trucks in which they must lie for one to two hours to air bleach. After air bleaching the goods must be washed through two or three washing machines so as to thoroughly remove all traces of chlorine; this may be tested by the starch-iodide solution in the usual manner. This solution is made up of one ounce of iodide of potassium and four ounces of laundry starch. These are separately and thoroughly dissolved in about one pint of hot water and then enough water is added to make the whole up to one gallon; if there is the slightest trace of chlorine left in the goods the starch-iodide will show a blue or brown coloration.

Antichlor acts as a reducing agent and is therefore not good to use, its effect is not permanent and goods finished with it are extremely liable to lose their bright white color and turn yellow in the cases, also if the goods are dried at a too high temperature.

It will be necessary for "C. M." to have a large supply of clean soft water free from calcium, magnesium and iron. The salient points in this process as given are, the steep before boiling, the souring after boiling and washing, and the elimination of the antichlor. These separately and combined will enable "C. M." to use weaker chemic for a shorter time as I think that a too strong and a too long chemicking is what is the matter with his goods.

W. B. (Maine)

Fancy Tops for Golf Stockings.

EDITOR COTTON:

In reference to the inquiry of "H. C. (Tenn.)," in the February number, the method used in producing fancy tops on golf stockings is that the tops are made on a separate machine built especially for the class of goods or tops. These machines are commercially built with two, three, and four color stripes and different stitch effects.

The tops, after being made on these machines, are turned and fixed for the operator to sew onto the stocking. The cost of sewing on the top after being turned and fixed for the operator is from five to six cents per dozen.

If the operator has to turn and fix her own tops before sewing on, the cost will be from 10 to 12 cents per dozen.

Of course the location of the plant and the labor conditions will be a factor to be considered in determining the price.

Old Knitter (Pa.)

Adopt a Four-Season Wear Production.

EDITOR COTTON:

In this letter I propose to illustrate why the business of the textile industry, especially the underwear branch, fluctuates continually, making it difficult to operate continuously and to consistently show a profit over a long period of time.

In order to prove my theory it will be necessary to go back twenty years or more. At that time all the mills manufacturing underwear made two seasons' wear and were never idle. This necessitated several days—between Christmas and New Year's Day, and between June 15th and 30th—to make the change from one class of goods to the other. And while it is true that there were not nearly so many textile mills then as now, and some may give that as the reason for the fact that the mills were then busy all the year, following the old adage that demand regulates the supply—still, the real reason was the two-season production.

Times and conditions change as we go along, and it is only natural that any successful business must keep abreast of the times in order to avoid a long interval existing between the taking of orders or the buying of raw materials and the delivery of the finished product—or, from the middleman's viewpoint, by the time the retailer is ready to offer it to the customer. Because of the conditions the

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buyer of textiles either may be a very shrewd buyer or a fool. In either case, all depends upon the upward or downward trend of the market, whether the buyer has all the various forecasts to observe and reports to study and the paid Babsons and others to predict when and where to buy and sell—often determines the shrewdness or foolishness of any buyer, and this naturally makes every buyer hesitate before buying in any quantity.

Now I propose to the entire knitted textile field to adopt a four-season wear production, and adapt and change their plants and equip them to manufacture what the public wants. In this manner any mill can demand its price, showing a reasonable profit, and run continuously, reducing the possibility of cancellations and uneven market conditions to an infinitesimal part of a minimum. In this manner, one season may at one time or another overlap, but under ordinary conditions this can in a large measure be avoided.

I used the word "theory" at the beginning, but I have actually put this theory into practice and have been amazed at the results—both from a financial standpoint and in mental relief. Another feature is that there will not be an overproduction and the buyer will pay the price or go out of business.

As an illustration, let us take a mill manufacturing light weight unionsuits, vests and drawers. At present it may only run on one season's wear. In this case they practically will run ten to eleven months on these lines, while it will take only about six or seven months to clean up the orders on the books. The balance of the period the mill will be running on stock supposed to be staple. What is the result? The buyer finds this out and finally the mill is, in many instances, forced to sell at the buyer's price, which is often at cost or slightly less, thereby cutting into the profits of the busy months.

On the other hand, should this same mill manufacture two seasons' wear, this overproduction, or cost or loss sales, would be materially reduced, while if this mill should manufacture four seasons' wear, there would be no chance for overproduction or cost or loss sales.

This can and must be done, and not until it is accomplished will this chaotic and unsettled condition in the knitted textile world be stabilized. It may require a large outlay in some instances to properly equip a mill to manufacture four seasons' wear, but according to my experience, there is always something to be made other than what the mill was originally designed for. There is no limit to what can be made in underwear. It is not necessary even to stick to underwear so long as a salable article can be made. Let me ask a question: How much business would a retailer do if he tried to sell heavy underwear with the thermometer registering 90 degrees in the shade? Doesn't the retailer and everyone trying to sell something endeavor to sell what the public wants? Anybody can sell something that is wanted, but it takes the best kind of a salesman to sell what is not wanted. There are certain lines of styles of underwear that are a glut on the market today, thereby demoralizing the market and breaking down prices, eliminating the profits necessary for the mills to exist.

I have put the foregoing idea into practice for four years, now, and stand ready to defend the theory or put it into practice in any mill. I have had 26 years experience in the textile business, and have made mistakes like all the rest. Whether I can be counted as a success or failure does not rest with me to say, but I know the four years just past have been very gratifying to me, and I feel that the system which did it will benefit others as well.

J. C. R. (Pa.)

Dyeing Hosiery.

EDITOR COTTON:

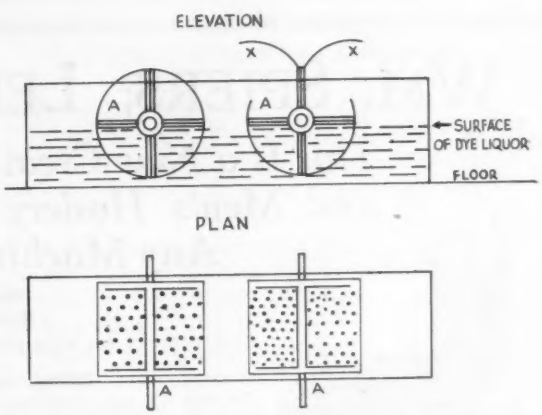
Please have some of the readers of "Knitting Kinks" tell what they consider the best method for stirring hosiery when dyeing in wooden tanks. We now dye about fifty dozen to a batch in an 8 x 2 x 2 tank. We tack them with a needle and twine in the welt, then we put 5 of one-half dozen each on a broom stick and draw them back and forth through the dye. We usually get very good results but we would like to secure a method that eliminates the operation of tacking, which costs us about three cents per dozen. Any information on this will be appreciated.

A. J. C. (N. Y.)

EDITOR COTTON:

I would suggest to "A. J. C.," who wants a method to eliminate the tacking of hosiery when dyeing, that he try an apparatus something like the one shown in the accompanying illustration for stirring his goods through the dye liquor.

I have taken his 8 x 2 x 2 tank and fitted into it the two wooden cylinders A, A, these cylinders are perforated with ½-inch holes all over, ends and periphery; each of these cylinders is operated with a belt and pulley and each must



run at the same uniform speed, say four or five turns per minute, but each drum must run entirely independent of the other.

Each drum or cylinder must be divided into four equal parts as shown in the sketch and each part must be furnished with a door or opening which can be opened and thrown back to permit the hosiery being entered and taken out when filling or stripping the machine. These doors are shown open in the elevation sketch at X, X.

When starting the batch, the hosiery, loosely tied in dozens, is packed loosely into all four of the divisions and revolved slowly for a given time through the dye liquor shown by the lines in the elevation. One of these drums can be stripped and filled while the other is running, or vice versa, so as to keep one running all the time.

W. B. (Maine)

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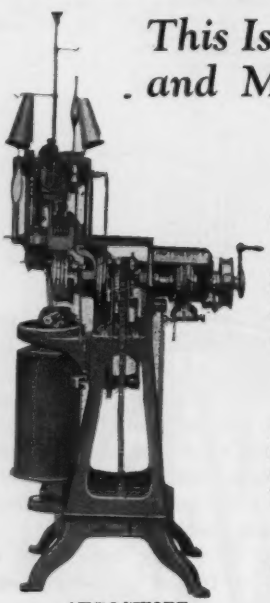

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Makes a complete sock all except seaming of the toe. Built in gauges from 6 to 17 needles per inch.

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EDITOR COTTON:

In answering "A. J. C. (N. Y.)"—in order to eliminate the tacking of hosiery when dyeing, and still get the same good results as with the present method, I suggest that he secure the knitted dye bags used for dyeing hosiery and put the same amount of hosiery or less in these bags. Tie the bags at the top with a stout cord and have a loop so as to slide them on the stick to work back and forth as at present. I feel that the result obtained will be just as good or better than the tacking method. Old Knitter (Pa.)

EDITOR COTTON:

The method of dyeing as outlined by "A. J. C." seems to be the best and cheapest under the circumstances. Where the equipment consists only of the old style open kettles, nothing remains to be done but to tack and bundle. It is far better than to put the hosiery in loose and pole or rake as is still done in some mills with small dyehouses.

Of course, the proper method for dyeing hosiery is in the modern rotary machines that handle the goods in an even manner, and permit thorough penetration. All things considered, cost of kettle-hands included, might it not be advisable to investigate the relative cost of a new machine of the type mentioned? Probably less labor would be required per batch, while the necessity of tacking would be obviated. The cost saved might be more than the interest on the cost of a new machine. T. A. M. (N. J.)

Knitters should remember the Knitting Arts Exhibition to be held at the Commercial Museum, Philadelphia, during the week of April 7th to 12th inclusive.

Overcoming Loop Wheel Difficulties.

EDITOR COTTON:

In answer to "H. C. K. (Pa.)," whose question regarding difficulties on spring needle loop-wheel knitting machines was published in "Knitting Kinks" in the February issue—

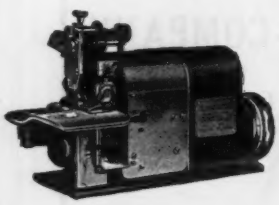
With reference to tucking in a vertical line and again at random, this may be caused by the beards being bent or a closed beard, and it may come from some rough spot in the loop wheel.

"H. C. K." says he is having trouble with drop stitches coming singly and in series without any break in the yarn. Drop stitches can be traced to needles not being properly lined, closed or a soft or rough beard will drop stitches. The yarn guide or carrier not being set close enough to the needles, or a loose stitch in knitting, are other causes; a little more tension in the yarn will help. If mercerized yarn is being used it might be of a harsh and wiry nature which would cause drop stitches. The remedy is to run the yarn over an oiled rag or an oil bottle with a wick in it. This will soften the yarn and take out the kinks.

Tight stitches are caused by cams being uneven, needles being bent, uneven lengths of beards, or needles not being perfectly even in height after being put into the lead. Tight pressers or tight sinkers will also cause tight stitches.

Too fast a speed will cause beards to break; the high speed has a tendency to crystallize the needle and the beard, causing them to break; too strong a pressure on the loop wheel, or a roughness in the loop wheel will also break beards. Heavy or uneven yarn will cause this trouble, as

MERROWING



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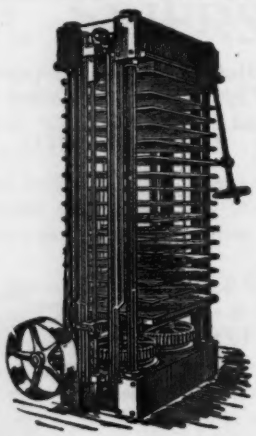

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will crowding too much yarn in the needle.

If needles are tempered too hard, they will break off, at the lead, or by putting the needles into the lead they may be getting more temper into them.

Old Knitter (Pa.)

Selling Heavy Weight Underwear with the Mercury at Fifteen Below.

EDITOR COTTON:

I have before me an advance copy of the letter of your contributor on "Four Season Wear Production."

This letter by "J. C. R. (Pa.)" is interesting inasmuch, at least, as he states in the last paragraph that after twenty-six years' experience in the textile business, the past four years have been very gratifying to him. I certainly would feel very grateful toward this man if he would but let me in on his tried and proved system in a way that would make it work in all cases.

It is true from all I know and hear that it is almost next to impossible to operate continuously and show a consistent profit in the knitted underwear industry.

I cannot go back as far as twenty years, but during the past ten years we have manufactured men's and boys' knitted union suits and shirts and drawers, light, medium and heavyweight fabrics. About five years ago we were forced to discontinue entirely the shirt and drawer end of production because there was practically no demand for the quality two-piece garments. During the past five years there has been a decided trend from the knitted to nainsook underwear, and this has had its effect upon our production and profits. Many knitting mills have installed a nainsook department, much to their sorrow, for the two manufacturing problems do not mix, and will not be attempted further by the wise knitting mill manager.

I have visited many knitting mills which were once known as strictly "ladies" mills, and find them to be in even worse shape to consistently produce than in mills of our type. Mills that for years made only ladies' lightweight and heavyweight union suits, vests and pants are today producing in addition to their standard lines, also bathing suits, sweater coats, hosiery, and other what-nots. The situation they tell me only becomes more complexing by these additions and further losses are incurred rather than increased profits.

During the past five years the light silk underthings for women have made serious inroads into the beautiful knitted fabric cotton and worsted mixed union suits, vests, and pants, until today the seemingly sensible underwear of our dear mother's time is almost an item of obsolescence.

True we know times and conditions change as we go along, but if all owners were to change over their mills, equip and adapt them to the every whim of the public, I can't see for the soul of me where the situation or condition will be changed. Over-production once more, and the same old cut-throat selling policy. What little surplus we may have once had, is now in the machinery manufacturers' pocket, and to our assets we have added some nearly new machinery, all of which will give us a lot of fun figuring the depreciation yearly.

Let me ask a question: How much business would a retailer do if he tried to sell heavy underwear with the thermometer registering 10 degrees (above or below, and either in the sun or the shade?) I have just returned from a few weeks' trip, and called on many retailers in the fine stores of Buffalo, Cleveland, Toledo, Detroit, and Chicago. Close observation absolutely proved that the retailer never did and never will try to sell anything. In the latter city for two days it was 15 degrees below zero. Newspapers read "Coldest Chicago in ten years"; the wind was most terrible; and as I interviewed the many buyers I would start my story by telling them "fine day for underwear sales," only to have one after another reply—"Yes, the nainsooks are moving rapidly, prices are higher, and so sorry I didn't order sufficient to carry me through the winter season." Oh, boy! and I was waiting to show him our fine new 75 per cent wool knitted union suit weighing about 17¼ pounds to the dozen.

"J. C. R. (Pa.)," kind editor, has something which should start a lively discussion among your readers, and to this end, those that indulge will have learned something which must be of value in the future operation of their mills. We must learn more. S. H. E. (Mass.)

What Makes a Machine Cut Yarn at the Heel and Toe?

EDITOR COTTON:

Will you please give some suggestions to remedy the cause for a machine cutting the yarn off in the heel and toe? We are having considerable trouble with this.

D. R. V. (Mass.)

EDITOR COTTON:

If the springs on the take-up are too strong, this may be the cause of "D. R. V.'s" difficulty. I would suggest that he investigate this, for the stronger the spring, the greater the load is for the yarn to pull. Where two take-ups are used the springs should be as near the same tension as possible. He should also see that the fingers and all the eyelets the yarn passes through are smooth. Rough rivets on needles will cause this trouble also, as will bent latches and sinkers, or needles split on the side; sinker cams set in too far will also result in this, and poor winding is another cause, as is a stitch that is too tight.

Old Knitter (Pa.)

A Machine to Close the Toe Automatically.

EDITOR COTTON:

Unfortunately I do not know of a full automatic machine that will transfer from rib top to plain knit and also close the toe, as asked about by "Automatic (Ky.)" in the December number.

I have been informed that a full automatic machine to transfer from rib top to plain knit and also close the toe automatically is being worked upon, but have so far been unable to locate who the party is or where he is located.

The Burson Hosiery Company use a machine that closes the toe automatically, but I cannot say whether this machine also makes the rib top and transfers to plain knit automatically.

To the best of my knowledge, the Burson Hosiery Company are the only people who use this machine and I believe they also own it. Old Knitter (Pa.)

The Yarn Market

Interest in the yarn market in Philadelphia seemed to pick up considerably during February. The satisfactory results of transacted business and banked profits were not so prominent, however, as might have been anticipated. This was caused by the difficult conditions that have affected this market for some time and which operate against the equable conduct of this business on lines of satisfaction and profit.

One of these has been the irregularity with which raw cotton has been conducting itself, together with the uncertainties that still exist in all quarters concerning the future, near and distant, of this all-important factor. The staple on the markets continued to fluctuate, and while yarns usually are sensitive to the ups and downs of cotton, it became, apparently, the case that other conditions affecting it were in preponderance as to influence, and prohibited the cotton fluctuations from having any noticeable effect upon yarns, considering the list as a whole. Except, of course, in special instances—which allows the effect of other influences to be felt, also.

Another unfortunate phase of the situation in this market is that there is a continuance of ultra-conservatism on the part of the yarn-consuming trade, reflected, possibly, from factors further along the line who feel it refreshing—at least safe—to operate with more or less empty shelves until the ultimate buyer takes it upon himself, they say, to settle the whole affair. The solution of the problem, it seems, rests upon the ability of the succeeding channels in the cycle of trade to move their supplies on to the next man, and it is apparent that there must be a smooth, certain liquidation before a permanent and satisfactory adjustment can be brought about in yarn market conditions.

The natural consequence of this condition was that there should be no record-breaking sales marked up in yarns. The market seemed to operate, basically, upon about the same plane as for the past few months.

It was true, however, that activity was better, and orders were more frequent, but these came in on the same hand-to-mouth basis, and it seemed the intention of buyers to continue this plan of piece-meal buying until something definite in general market conditions comes to light. They have been so far content, apparently, to purchase for their immediate requirements only, as orders are received by themselves, thus playing the safe game.

Along with the continued dullness in buying interest came further reductions in price, bringing the rates on some of the counts to new low levels. As examples—comparisons in the list published here last month and the one appended in this issue show drastic reductions in rates of some of the representative numbers—30s single warps lost a nickel from January 19th to February 16th, being quoted at 54 cents on the latter date. In two-plys, 30s skeins were off about three and a half cents to 54 cents, and 30s warps were reported six cents under the January price of 60 cents. 30s coned carded yarn for hosiery dropped off four cents to 55 cents on the February quotation.

That price was not so much a factor in the lassitude of buying interest was indicated by the fact that drastic reductions brought on no sudden manifestation of interest from the consumers, who, on the other hand, came to market, at the established price, when they needed yarns to cover orders of their own.

There seemed to be a ray of hope that the yarn-consuming trade will soon have a renewal of activity, and much interest is of course placed in this by yarn factors. Yarn mills are reported to be manufacturing yarns in the face of the restricted outlets through this market, and an opened avenue of distribution would assist materially by the diminution of some of these stocks.

Quotations for the Philadelphia market on February 16th follow:

Single Skeins.

4s to 8s	43½	10s	44½
12s	45½	14s	46
16s	46½	20s	48½
24s	50½	26s	52
30s	53½		

Single Warps.

8s	44	10s	45
12s	45½	14s	46½
16s	48	20s	49 @49½
26s	53½	30s	54 @54½
40s	62 @63		

Carpet and Upholstery Yarn in Skeins.

8s and 9s 3-4 slack	45
8 3-4 tinged tubes	40
8 3-4 hard white warp-twists	43
8 3-4 hard twist waste	39

Two-Ply Skeins.

8s	43½	10s	44½
12s	45½	14s	46½
16s	47	20s	49
24s	51½	26s	53
30s	54 @54½	40s	63 @64

Two-Ply Warps.

8s	44½	10s	45
12s	46	14s	47
16s	48	20s	49 @50
24s	52½	26s	53½
30s	54 @55	40s	64 @65

Frame Spun Carded Yarn on Cones.

8s	44½	10s	45
12s	46	14s	46½
16s	47	18s	48
20s	49	22s	49½
24s	51½	26s	53
30s	55	40s	63 @64
30s double carded	57		
30s tying-in	53 @54		

Two-Ply Combed Peeler Skeins and Warps.

8s to 16s	65	20s	68
24s	70	30s	73
40s	78	50s	83
60s	90	70s	1.05
80s	1.20		

Mule Spun Carded Yarn on Cones.

10s	50	12s	50½
14s	51	16s	51½
18s	52	20s	53
24s	55	26s	57
30s	61	40s	70

Mule Spun Combed Peeler Yarn on Cones.

10s	56	12s	57
14s	58	16s	60
18s	61	20s	62
22s	63	26s	68
28s	69	30s	71
36s	73	38s	78
40s	80		

Permission has been obtained to erect a two-story building alongside Textile Hall, Greenville, S. C., for use during the Sixth Southern Textile Exposition, October 20-26. These plans were made necessary by the overflow of applications for space already received that assure the success of the show.

This building will be near the Washington Street front, alongside Textile Hall, and will be reached by six large galleries. It will be less than twenty feet from the main building, it is stated, and will be lighted on three sides.

The show this year promises to supercede all its predecessors, it is announced by President Williams G. Sirrine.

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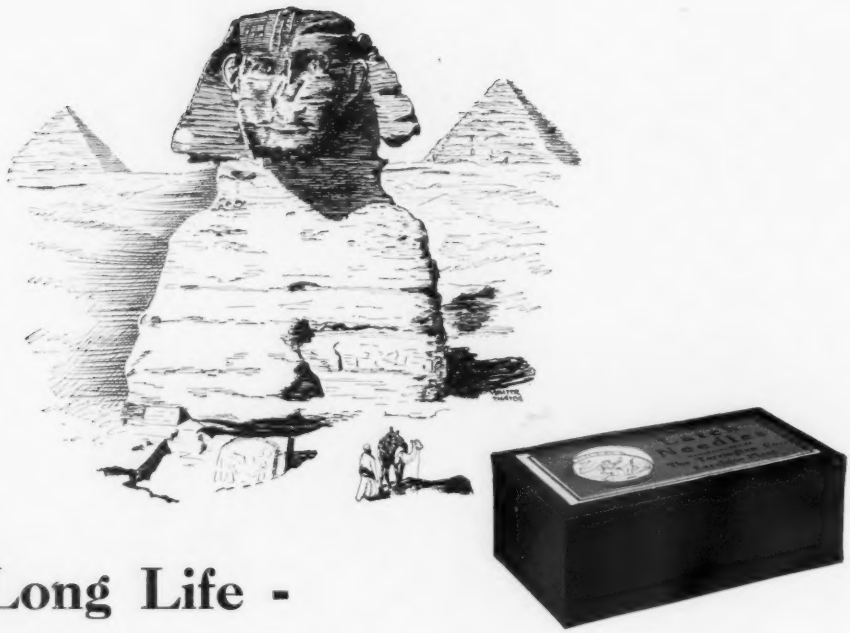

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The Knit Goods Market

The persistence with which knit goods jobbers are resisting prices and the apparent intention of retailers to have mills and jobbers carry stocks for them—policies which virtually were declared during the Fall months of last year—are viewed as giving color to the opinion frequently heard in the trade that distributors started out to break the market at the outset of the present year. While there is no evidence of an organized movement in that direction, there has been concert of action, and last month showed no abatement of effort to stem the tide of firm to higher prices of raw materials. In spite of the strategic position and strong front maintained by buyers, wool went to a higher level and cotton about held, while in the market for artificial silk there was an approach to collapse that proved the more disturbing development in textiles in many months.

Artificial silk, which recently was rechristened "Glos," a term which is now being passed to the trade generally, tumbled because stocks of the domestic product were top-heavy and foreign interests found it expedient to undersell the American markets. World production increased last year by about 26 per cent—conservatively estimated. As the United States consumes approximately 35 per cent of the whole, estimated at 100,000,000 pounds, and Europe, with exchange weak, in a less favorable position than formerly for consuming its quota, selling pressure abroad is readily accounted for. Mills here were buying ultra-conservatively while distributors of finished goods were conducting their bear campaign, and meanwhile imports of the fiber were piling up and domestic production was being maintained. Then, when holders sensed the situation which it was known among producers was developing, and found it expedient to get out from under, an importer announced a cut of fifty cents a pound and a domestic manufacturer lopped off 75 cents. Over night artificial silk had declined in value by 27 per cent.

The fiber had been slipping for several weeks before the big drop, and observant manufacturers were not wholly unexpectant of what happened, though not prepared for anything quite so drastic.

If distributors really were bent on smashing the market they may have been gleeful over the break. But was there a rush to buy such hosiery at presumably lower prices? There was not. On the contrary, intimation was given that prices of goods on order would have to be revised or orders cancelled, and mills received the customary suggestion from merchants having goods in transit that they, the merchants, could not use the goods unless invoiced proportionately lower on the new price schedules. Manufacturers who carry stocks for dealers received a prompt and forceful reminder of the danger of doing so. Some, unless the big glos manufacturing companies grant them a rebate on fiber in stock, may sustain severe losses.

Glos would not have slumped had there not been overproduction. Mills would be getting more nearly adequate prices for hosiery and underwear if jobbers did not believe there was overproduction of these commodities also. It is an open secret that in at least one staple line of hosiery, manufacturers have large stocks which they have not been able to move at prices based on cost. One manufacturer some weeks ago reduced his price by approximately 15 per cent and disposed of his holdings at a loss, with no advantage accruing to the consuming public, as retail stores are holding for wartime profits—and to a considerable extent getting them. A manufacturer who grants that the retail price might justifiably be twice what is paid to the mill, found a store taking down a profit of 148 per cent on a stocking which he bought from a jobber at $2.85 a dozen and had priced "59 cents, reduced from 65."

In their assault on the prices of cotton hosiery and underwear, jobbers have had unsought support from sharp curtailment in New England cotton mills. Interests displeased with this reduction of stocks by eastern manufacturers say there was no excuse for it; that "southern mills making similar goods are busy." This explanation is the explanation also for the slowing down in New England, where the result of overproduction four years ago has not been forgotten. It is being overlooked in the hosiery trade right now, for even among mills in some sections of the South, according to trustworthy report, there are cumbersome stocks.

After a mill in North Carolina had accumulated a lot of low end half hose, the management thought it might be a good idea if all manufacturers of like goods shut down on production. The idea was a good one, but has not taken root. It is observed there is less cohesiveness among manufacturers than in the ranks of jobbers. Telling of a recent experience, a mill head said: "While in New York I sold a few cases of goods on the East Side at a substantial price recession. By the time I got back to my agent's office on Broadway the hosiery trade, it seemed, knew how many cases I sold and how much I got for them. I am convinced the little jobbers maintain close contact among themselves, spreading information of the slightest deviation from the market, while we manufacturers are not able to come together for mutual good, as though suspicious the truth might hurt us."

The hosiery market last month showed some recovery, at the start, from the inactivity in January, but it was in the buyers' favor, and suffered some disturbance with the smash in the glos market. Both cotton and silk hosiery were affected by the sensational drop. Tram silk had been softening for some time, and it was a question whether further decline might not be hastened by what befell its competitor, the artificial, which, being extensively used in combination with tram and with mercerized combed peeler yarn, was regarded as liable to drag the market down for pretty much the entire range, all-cotton goods excepted.

It is in the all-cotton hosiery that overproduction probably has been heaviest, in the putting of low price yarns into finished goods for having them ready for those jobbers who are buying for only immediate delivery, and not a great deal at that. Jobbers give no evidence of being disturbed over the probable shutting down by manufacturers rather than continue operating with yarns at such a level that, at this writing, they cannot get cost out of their goods.

EFFECTIVE
FEBRUARY 1, 1924

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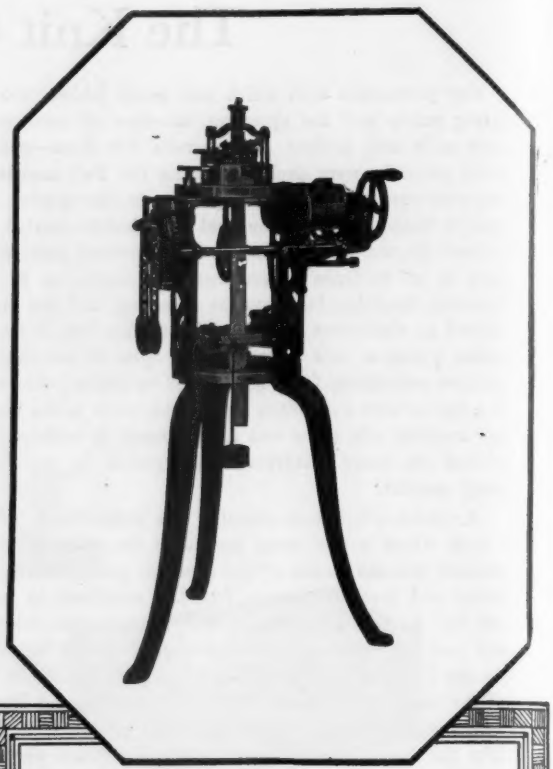

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Philadelphia Pennsylvania

Stocks are going to be reduced by some mills for their salvation; some mills will quit operating for a time, awaiting a better market. A few of the larger concerns, if present plans are carried to maturity, will expand their plants for reducing overhead by increased production. One manufacturer in the Philadelphia territory contemplates abandoning one of his mills and operating the other without expanding, taking the position that with but one factory his cost per unit of the class of stocking which he will continue making will be less than if he had the second to look after. Thus are masters of industry devising means for getting cost down to a safe competitive basis, and this is not confined to knit goods.

Only a comparatively few mills making silk hosiery can boast of sales equal to capacity production. There has been some improvement in full fashioned silk hose, however, more particularly among mills which have discontinued their ingrain lines and are turning off dip-dyed exclusively.

Demand for ingrain silks is almost nil, a manufacturer here and there still having calls for the more expensive types. A well advertised mill selling to retailers is having exceptional business in silks in the moderate priced range. At the moment, the direct-to-retailer mills appear to be booking more business, relatively, than those distributing through jobbers, the situation being the reverse of what it was a few months ago. But with most of the direct sellers the best that the management will say is that this year opened about as well as last year did.

There has developed very keen rivalry as between jobbers and manufacturers selling the retail trade, many of the latter having added new accounts in 1923 and being out for further additions in 1924. While there has been raised a cry against carrying stocks for dealers, the retailer mills, being closer to the last link in the chain of distribution, probably will go further in doing that very thing than will jobbers, and therefore would appear to be in the more advantageous position. Few of the retailer mills selling under their advertised brands manufacture low end cotton goods, preferring to either not handle them or buy and distribute without branding.

Since the campaign inaugurated by the Full Fashioned Guild for exploiting the flat knitted has been abandoned, for reasons not stated, the further popularizing of the fashioned, it appears, is to be effected by putting prices down to the last notch, to about the level attained by the better types of the circular knitted—around $10 a dozen to jobbers, which until quite recently was the price of one mill for full fashioned silk in combination with glos.

Distress stocks of full fashioned appear to have been pretty well taken care of, but in colors that no longer are in demand there still are goods at sacrificial prices. Last month a lot of black, cordovan and white, circular knit and bearing the name of the mill—one of the larger and better known—was being offered by a commission house at $4.50 a dozen. While, from the standpoint of actual cost they would have been good value at a dollar a pair and could have been put on the counter at 75 cents, the stockings seemed to be treated as outcasts. Trying to keep pace with color style changes and carrying stock for dealers makes the silk hosiery game more exciting than profitable.

Except as to novelties, cheap combed and carded hosiery ought to be in a better position than most lines. If it is not, the blame rests with the manufacturers, who clearly have it in their power to more nearly balance production with distribution, and are not materially affected by the slump in glos and the unsteadiness of the tram silk market. There has been good call for carded goods, at a price, of course. A chain store is understood to have bought comparatively recently a very large lot of misses' coarse gauge ribs, at $1.10 a dozen for size seven, with a rise of five cents per size. Asking prices ran as high as $1.15, rise 7½.

A week or two ago a commission house was offering an order for 12,000 dozens of boys' ribs to weigh 44 ounces on size nine, shipments to be equally distributed over four months. The house was trying to buy at $1.85 a dozen, which was from 10 to 20 cents under what some mills then were quoting. The subsequent decline in yarn encouraged the buyer to believe his terms would be accepted.

An accumulation of automatic top carded half hose was being held by a southern mill for 85 cents a dozen. Whether the boys' ribs were bought at 85 cents and the automatic top socks sold for 85 has not been ascertained.

Quotations on low end hosiery of 176 needles for men and women show such a variance as to make them meaningless except as showing a difference in manufacturing cost or willingness of some mills to sacrifice. It is understood that the Rome (Ga.) Hosiery Mills, presided over by John M. Berry, last year sold its output for over 300 working days and has had a good outlet this year. Although Mr. Berry grows cotton and spins yarn he is reputed to get about as much for his mill production of hosiery as manufacturers who buy the yarns they consume.

Women's combed yarn hosiery, which last month was marked down a nickel a dozen by one large establishment, was moving less freely than half hose of combed yarn at the same price. The latter has been a free seller for some mills for the last year and was slow to fall under the assault of jobbers leading a lower price movement.

The draggy market for combed and mercerized hosiery was indicated last month when the Moorhead Knitting Co., Harrisburg, Pa., announced a reduction of 10 cents a dozen on each of several numbers. The company sells to the retail trade. This is but one of many illustrations that might be given for showing hosiery prices are in some instances lower than when hosiery yarns were costing manufacturers more money. In fact, not a few manufacturers say they are selling their goods on the basis of cotton at 23 cents.

Mercerized hosiery continues in light call, and prices are more nearly what mills can get than what they ought to be getting. While in ladies goods it is the plain, staple mercerized that seems to have fallen back, it is stated by manufacturers of ribbed hosiery in the semi-sports class that demand is not up to what it was last year. This may be ascribed to increasing production of the ribbed when the plain declined in sales.

One mill making an exceptionally good mercerized ribbed-to-toe sold heavily when six or eight months ago the line first was put on the market, and although it now is selling to more jobbers, their aggregate purchases are

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less than the total at the outset.

Some manufacturers report fairly good sales of mercerized half hose, others stating they cannot get cost out of the goods. Strictly high grade mercerized socks are promising of improvement in sales, while the low end, made to fit a jobber price, seem to not have so good an outlook, the impression prevailing that there is no profitable place for anything between a first class mercerized and high standard combed. The cotton top mercerized appears to be in about the same relative position of the automatic top carded, sold not so long ago at a dime a pair. A better proposition, it is believed, is A1 144 needle socks of better than the usual in this needle division.

Misses' fine gauge combed ribs have been a subject of surprise from more than one angle. In the first place, sales ran large throughout the last half of 1923 and jobbers still are buying, notwithstanding a very great increase in business in novelty ribs. Production of the plain combed was in big volume and prices became variable on offerings in excess of what the market was ready to absorb, declining in about the proportion that yarn advanced. This state of affairs no doubt was brought about by the swing to the fancy top derby and English ribs, for which there have been placed substantial repeat orders. One mill making the ribs with the jacquard top had demand equivalent to full weekly production with machines being operated 24 hours a day, and another was pressed for deliveries while working till 10 o'clock nights.

The fancy top ribs have proved so strong a seller that it need not be surprising if by this time next year plants making them be expanded. Their popularity, however, would seem to preclude the notion that even a year hence there will be excess output, but competition may be keener and prices lower, with the probable result that plain combed will be in less demand.

Infants' mercerized socks appear to have been largely overproduced last year, judging from well authenticated reports of troublesome stocks in several Pennsylvania mills, with one, however, understood to be sold up to May. A manufacturer's explanation for the congestion is that there were considerable carryover stocks from the previous season, and that as many new patterns were brought out for the current season the leftovers got into the class of distress goods. That accounts only in part for the accumulations.

Soon after the opening last year, as primary market interests recall, a leading manufacturer who had canvassed the larger jobbers in advance of the opening and received little or no encouragement—having gone out prematurely—reduced his prices. This was disturbing at a time when it was believed the average jobber was ready to operate, and it was some time before the market became sufficiently steady to inspire confidence. Furthermore, among the new patterns were the product of less than a half dozen mills which had specialized in artificial silk tops and the fiber in combination for the leg. Sales of this type were so large that they must have cut into those of the standardized mercerized, in which there had been much plant extension. Trustworthy reports of mill stocks indicate that, although, it is contended, mills were not operating to capacity, the accumulations exceed the aggregate imports of all classes of cotton hosiery.

Four years ago an average of approximately 1,000,000 dozen pairs per month of American cotton hosiery was being exported. The monthly average for the last six months of 1923 was about 350,000 dozens. It is obvious that much of the surplus hosiery can be attributed to declines in exports.

Retailers are much disturbed by the increasing sales of hosiery by direct-to-consumer sellers—the catalog houses and establishments employing canvassers—both of which continue to make substantial gains. The direct sellers, it is clear, must carry stocks, something that the average retailer rebels against. He wants the manufacturer and jobber to do that for him. Furthermore, distributors want prices guaranteed against sellers' declines, and when style changes suddenly or the raw material markets undergo what befell artificial silk (glos), there is recourse to cancellation, an offense which some manufacturers themselves admit they condone.

Retailers, by not carrying well assorted stocks, and by their adherence to wartime profit schedules, have contributed to the success of the direct-to-consumer sellers, and there will be more of them if many of the small merchants do not revise their tactics. Legislation for checking them is proposed by the National Association of Retail Secretaries. Statutory prohibition of business by mail or sales from factory to consumer, it is held by some manufacturers not favorably impressed by canceling retailers and their determination to have mills finance them, would not be in the interest of the public, and therefore not likely to be enacted.

One of the larger and better known hosiery manufacturing corporations quite recently passed its usual dividend on preferred stock, which is equivalent to saying there were no earnings for the holders of the company's common stock. The dividends which ordinarily would have been paid had gone to distributors in the form of recessions from profitable prices. A New York State underwear manufacturer, shooting over the heads of the haberdashers and small retailers, delivers a broadside against department stores and jobbers. "Mill after mill," he says, "slows down, goes on half time or shuts up entirely because it is impossible to break even on the contracts buyers offer. A buyer is in New York trying to place business for the coming season at last year's prices, and refuses to leave any orders unless on the old price basis."

While considerable underwear for the winter of 1924-5 has been contracted for, the bulk of the selling was by a group of southern mills which came on the market three months ago. New England and New York State manufacturers, who deferred until last month the naming of prices, have had a disappointing response from jobbers. While reports of the business actually placed are contradictory, the most liberal estimate is far from encouraging.

That mills are not getting the looked-for early business is indicated by the fact a number in the Mohawk Valley have been slowing down. At the rate production is being tapered it would appear that when, eventually, buyers do come to market they will find little stock for deliveries in the early months and that perhaps demand for preferred shipments may be sufficient to give mills a cudgel for beating buyers into paying prices commensurate with cost.

Commenting on what he says is the danger in making

early commitments for winter underwear, the buyer for a nationally known jobbing house points out that there may be no less danger in not buying. It is his policy to place contracts for about 25 per cent of estimated requirements and do no more buying until after something fairly definite in relation to the oncoming cotton crop is available, and then be governed by retailer attitude. At this rate, it is admitted, many mills either would have to shut down wholly or in large part or put goods in stock. This, it is felt, will not be done, for it is shown that stock goods almost invariably hold mill prices in check, jobbers playing mills with no stocks against those which have supplies. The outlook, therefore, is for curtailment and considerable unemployment among underwear mills in the northern manufacturing centers unless jobbers soon operate more freely. They say they are ready to buy now, but insist they will not pay prevailing prices.

New York State mills went the limit when in January they reduced wages in one city in order, they said, to meet competition with southern manufacturers. Viewed from any angle, the situation at the moment is not a cheerful one, the odds, howevers, favoring group action for holding production down temporarily.

The jobbing trade would be disposed to give more kindly consideration to Winter underwear if retailers were placing forward orders for Summer weights, which shortly will be put on their shelves. It appears they purpose beginning the light weight season with what little stock they may have carried over from last year. They are represented by jobbers as taking the stand cotton will drop and that underwear prices must decline with cotton, overlooking the fact that goods contracted for last year by jobbers are available at the 1923 prices and, in instances, at even less, while current mill quotations are materially more.

It is known that retailers have been offered certain staples in light underwear at a recession of 10 per cent from jobber prices based on the opening, and could not be interested. Some jobbers are not pushing light weights. They are well covered for the season at what now are regarded low prices and reason that soon or later retailers must come into the market. Jobbers so situated, it is believed, then will base prices on replacement, which on present levels would be painfully higher than current quotations to the retail trade.

Most of the mills making men's light weight knitted underwear still are running on orders, but it is admitted they shortly will be in need of business. That they are fairly well situated as to business on their books is indicated by the fact there is being exerted no great pressure on buyers and that the new schedule for prices is being adhered to, with possible recessions by a mill here or there seeking steady volume production as an overhead expedient.

It is doubted that mills will make even light weights at this time for stock, for it is recalled that late last year cancellations of winter garment orders ran heavy, December showing an increase of approximately 300 per cent over the previous December. If the distributor find he is vindicated in his stand against cotton goods at current prices, he would not be slow to cancel summer lines even though his stock were at the point of depletion. At any rate, he would use the threat of cancellation as a club for forcing rebates, and well do mill and jobbers know it.

Accepting at their face value representations of jobbers that retailers as a class are making practically no provision for the coming season, it would appear they, the jobbers, have not been getting their share of the business that it is possible to get. Mills selling the retail trade direct tell of substantial buying in a conservative way. In fact, they are reported so well supplied with business that several mills distributing through jobbers exclusively are eliminating them entirely.

The J. C. Dettra Company, Inc., a Pennsylvania corporation at Oaks, near Philadelphia, making men's and boy's athletic suits, switched from jobber to retailer as late as last November, after buying had been under way for some time, and a month ago had sold up to May, according to a person speaking for the organization. The company sells on terms of two per cent discount in ten days, net 30, and on comparable lines is understood to be getting prices 50 cents a dozen below those of jobbers for garments to sell at one dollar. Another Pennsylvania mill, making ladies' knitted light weight underwear, has the groundwork for a direct-to-retailer campaign and shortly will also cease selling to jobbers. If they must carry stocks for dealers, some manufacturers say, they would prefer assuming the burden for the retailer, since many of the jobbers really are buying on a retail basis.

Jobbers have lost ground in hosiery, underwear and sweaters. This is shown in continued increases in the number of mills selling direct and the gains which the established mills in this class are making in the matter of new accounts.

Captain Irving O'Hay, United States Army (retired), humorist, traveler and thinker, and a veteran of seven wars, has been obtained as the speaker at the annual luncheon of the National Association of Hosiery and Underwear Manufacturers to be held in the Rose Garden of the Bellevue-Stratford Hotel, Philadelphia, at 1 p. m., Thursday, April 10, 1924. The luncheon is to be held in conjunction with the 20th Annual Knitting Arts Exhibition, April 7 to 11 inclusive, and the annual convention of the Association at the Bellevue-Stratford, April 9 and 10.

Captain O'Hay is prominently known as a brilliant and forceful speaker with a magnetic personality. The story of his adventures, his anecdotes and "punches" with which his addresses are punctuated have made many brilliant audiences think—and laugh. He is credited with being the original hero of Richard Harding Davis' "A Soldier of Fortune." He fought in Cuba as one of Colonel Roosevelt's Rough Riders, in the African Boer War, in the Balkans, in Serbia in 1905, in Honduras, in Nicaraugua, and in Mexico in 1910. He also served in the "Princess Pats" early in the world war and later in the U. S. Army. Irvin Cobb describes him as a "connoisseur of wars." Captain O'Hay will be the only speaker at the luncheon.

Covers will be laid for only 300 at the luncheon, the announcement to the members of the association will read, at the usual charge of $2.50. An exceptionally fine orchestra is being arranged for in addition to the speaker. Reservations will be made in the order of application, which will be received now at the association's offices, 334 Fourth Ave., New York City, or at the headquarters booth, Commercial Museum, during the exhibition.

Among the Knitting Mills

The Evenknit Hosiery Mills, Bay City, Mich., have preliminary plans under advisement for the construction of a new addition to their mill on North Walnut Street, to be two-story, with estimated cost reported in excess of $50,000, including equipment.

The Eastern Sweater Mills, Inc., Brooklyn, N. Y., recently organized with a capital of $50,000, will operate a local plant for the manufacture of a line of knit goods. The company is headed by A. Madison and J. Dunn; it is represented by Moers & Rosenschein, 2 Rector Street, New York.

The Par Knitting Mills, Inc., 2007 South California Avenue, Chicago, Ill., has been formed with a capital of $60,000, to operate a local plant. The new company is headed by M. S. Weiner, H. H. Newberger and E. C. Westlen.

The Wayne Knitting Mills, Inc., Fort Wayne, Ind., is said to be planning for the construction of a new addition to its local plant for considerable increase in production. Details will be perfected and estimates of cost asked at an early date.

The B. V. M. Knitted Textiles Corporation, New York, is a new company recently formed to operate a local knitting mill, for which plans are being arranged. The company is headed by C. Richardson and L. Pantell. It is represented by J. J. Pantell, 291 Broadway, New York.

The Apollo Knitting Mills, Philadelphia, Pa., have leased a floor in the building at 222 North Twelfth Street for a local plant, and will commence operations at once.

The Roper Knitting Co., Canandiagua, N. Y., has tentative plans under consideration for the erection of a new addition to its local plant, to consist of two individual structures, estimated to cost close to $100,000, including machinery.

The Becker & Koeppel Knitting Mills, Inc., Brooklyn, N. Y., recently organized with a capital of $25,000, will operate a local mill, for which plans will be perfected for early production. The company is headed by I. S. and S. Koeppel, and B. Levine. It is represented by Moers & Rosenschein, 2 Rector Street, New York.

The General Knitting Co., Philadelphia, Pa., has taken out a charter under Delaware laws, with capital of $525,000, to install and operate a local mill for the manufacture of knit goods. The company is represented by the United States Corporation Co., Dover, Del.

The Morton Knitting Mills, Inc., New York, lately formed with a capital of $10,000, will operate a local plant. Plans will be arranged at an early date. The company is headed by R. Michael, S. B. Stein and others; and is represented by A. L. Lazarus, 154 Nassau Street, New York.

The Strutwear Knitting Co., Eleventh Avenue, Minneapolis, Minn., has tentative plans under advisement for the construction of a new addition at its mill, with reported cost placed in excess of $50,000. It is said that bids will be asked in the near future.

The Endurance Knitting Co., Philadelphia, Pa., will commence the immediate construction of a new addition to its plant to cost approximately $15,000. Additional equipment will be installed for increase in output.

The Everlastik Knitting Mills, Inc., Philadelphia, Pa., recently organized with a capital of $25,000, will operate a local plant, for which arrangements will be perfected at an early date. The company is represented by the Corporation Guarantee & Trust Co., Land Title Building, Philadelphia.

The C. & K. Knitting Mills, Inc., Brooklyn, N. Y., has arranged for an increase in capital to $20,000, for general expansion.

Litman Brothers, Inc., New York, N. Y., has been formed under state laws with a capital of $25,000, and will operate a local plant. The company is headed by I. and N. E. Litman, and is represented by A. A. Weinstein, 189 Montague Street, Brooklyn, N. Y.

The Wolverine Knitting Mills, Inc., Bay City, Mich., has arranged for an increase in capital from $50,000 to $100,000, for general expansion.

The B. B. D. Knitting Mills, Inc., New York, N. Y., has been organized with a capital of $20,000, to operate a local plant. The company is headed by M. Winkler and I. Einbrun. It is represented by W. R. Altman, 277 Broadway, New York.

The Rockford Knitting Co., Rockford, Ill., has plans under way for the rebuilding of the portion of its local plant, recently destroyed by fire, with loss reported at $20,000, including equipment.

The Highland Park Knitting Co., Highland Park, N. J., recently organized with a capital of $50,000, is planning for the operation of a local mill. The company is headed by Frederick Manterer and DeWitt B. Straus, 431 Raritan Avenue, Highland Park. The last noted is representative.

The Ashland Knitting Mills, Ashland, Ala., successors to the Talladega (Ala.) Knitting Mills, have recently started the manufacture of men's seamless hose in a new one-story brick plant, 50 x 200 feet. The new building is equipped with 49 knitting machines, 11 ribbers, 8 loopers and one sewing machine. W. A. Kitchens is president; A. L. Hardegree, treasurer; J. H. Jackson, superintendent.

The Appalachian Mills, of Knoxville, Tenn., recently acquired the Knoxville Spinning Company and the Tennessee Mills. The mills purchased have been owned and operated by the interests of General L. D. Tyson. The new owners will doubtless centralize the control, and this acquisition, it is announced, makes them among the largest manufacturers of men's heavyweight underwear in the country. J. T. Brownlee is president of the Appalachian Mills company; R. N. Lotspeich is vice-president, treasurer and general manager; R. L. Henry is secretary, and A. E. Warren is superintendent.

The Orion Knitting Mills, Kinston, N. C., have installed 27 machines for the manufacture of knitted coats, and the initial capacity is 60 dozen garments a day. Woolen and cotton sport coats will be turned out. The mill originally made only cotton hosiery but for the last few years have been knitting large quantities of silk and woolen hosiery.

S. D. Bausher, head of the Glorie Underwear Mill Reading, Pa., has purchased a building and will move equipment of his underwear mill into the new quarters. It is reported the vacated plant will be used to increase output of Acorn Hosiery Mill, Inc.

The Slump in Artificial Silk Prices.

Since the tumble of artificial silk prices on February 1 by from 55 to 85 cents a pound, bringing the fiber down to near the prewar level, the air has been surcharged with gossip dealing with the reasons for the sudden action of the several manufacturing companies.

First and foremost of the causes for contradicting the oft repeated assertion that prices of artificial silk were stable and not likely to undergo any material change was the increasing imports. While fiber from abroad was being piled up in American warehouses, however, prices of the domestic product remained comparatively steady. Then some manufacturers consuming artificial silk became suspicious that prices were being maintained for reasons other than demand, and now it is stated there was being promoted a quiet movement for asking the Tariff Commission for a lower duty on the fiber; the contention being heard that prices which the manufacturing companies were receiving were out of line with the cost of production.

Under the Fordney Act—the Tariff Act of 1922—"Yarns, threads and filaments of artificial or imitation silk, if singles, are subject to a duty of 45 cents a pound; if advanced beyond the condition of singles by grouping or twisting two or more yarns together, 50 cents per pound; but none to pay a less duty than 45 per cent ad valorem."

From the fact imports were so large, and that foreign fiber could compete in price with the domestic product, it was reasoned that manufacturers were taking down fancy profits. But manufacturers using imported fiber in goods which they exported really were relieved of duty cost, as they are allowed a drawback equivalent to about the duty paid on the raw material, so that there appears to have been an advantage in using the imported, and obviously this had to be met by the domestic manufacturers of the fiber. The drop came too suddenly for even the promoters of the lower tariff movement.

Some days before announcement of the lower price schedule, it is stated by manufacturers, they were given a quotation on a grade of fiber not designated by a letter, but said to conform to one of the two more popular grades in 150 denier, which was approximately 75 cents under the then market, and a Pennsylvania mill is said to have bought heavily, getting the stuff at less than the present price.

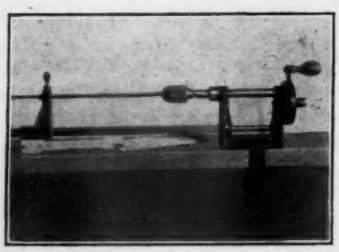
With one large manufacturer of fiber proposing to mills a 50-50 rebate on silk taken in during January, and another announcing it would make no rebate on shipments prior to January 31, much dissatisfaction among mill consumers developed, along with price competition in yarns made from 150 denier fiber and two threads of tram silk. For about a week quotations to mills were $2.35 a pound by one concern, $2.45 by another and $2.55 by a third, and then came announcement from Chicago of a quotation of $2.30. Meanwhile manufacturers of hosiery and sweaters were trying to adjust with their customers differences arising out of the slump in the fiber, while receiving flat cancellations from some jobbers.

One mill gave a jobber a rebate of 50 cents a dozen on ladies fiber boot stockings taken in during the first week in January. Some rebated more than that on goods to be delivered or shipped out after February 1. One jobber, who threatened to cancel the remainder of his order if he were not given a rebate on shipments previous to February, was told by the manufacturer to cancel, the sooner the better; that the mill then was busy, but that there would be no rebate on goods shipped prior to February 15.

The drop in artificial silk was the hardest bump sustained by mills using the fiber that has been experienced in the textile trades in a long time. Not since the latter part of 1914 has cotton, with all of its ups and downs, caused so much confusion.

A Useful Spring Winder.

A device that is useful wherever springs are employed has been developed by C. A. Scholl, 536 West Tioga Street, Philadelphia, Pa. It is known as the Scholl improved spring winder, and is shown in the accompanying illustration. Clamped to a bench, table or other convenient place it is always ready for use and requires little room. Push and pull springs ranging from 1/32 of an inch to one inch in diameter, and in any length, can be readily made as needed, eliminating the use of lathes, or delays in waiting for new springs. The spring winder is fitted with



an internal gear that increases the speed in ratio of three to one. It is also equipped with a movable tail stock that slides on a square guide arm while the spring is wound, and allows the use of any desired length of arbor or mandrel from ½ inch to 15 inches in length. The machine is a durable tool, positive in action, small, compact and foolproof. Little or no experience is required to use it. It is pointed out to be a valuable adjunct to the equipment of a machinist, machine fixer, and section hand in charge of machines where push and pull springs are employed, such as in hosiery and underwear mills.

A summer school for mill teachers will be held at the Georgia School of Technology, Atlanta, Ga., from June 23rd to August 5th, it is announced by officials. This will be similar to the summer school conducted at Georgia Tech last year which was attended by teachers from Georgia, Alabama, Tennessee, South Carolina and Virginia.

The purpose of the school is six-fold, among the objectives being to offer a program of definite training for teachers in textile communities, including a study of mill operations; to give teachers and social workers an industrial background and social attitude beneficial to them in directing their activities, etc.

Mill executives are urged to cooperate in sending the teachers in their villages to this short course. The State Board of Education has approved the summer school and authorized the holding of examinations and the approval of attendance upon its course as satisfying renewal requirements. Information may be secured from Federal Board for Vocational Education, Ga. Tech, Atlanta, Ga.

5 Painters' Work—1 Man Cost

CONSIDER your saving in labor cost alone when 1 DeVilbiss spray operator does the work of 4 to 5 hand brushers. That is the average economy effected in painting your mill interior, its outside walls and the village homes with the

DeVilbiss
Spray-painting System

Additional advantages are: a more thorough and uniform coating; a coating with the hiding power of two brushed coats; less scaffolding; no costly replacing of brushes; cleaner work with less interference with mill operation.

Investigate this modern, low cost DeVilbiss way of painting—details gladly mailed.

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The Improved ROME Dyeing Machine

Made of

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Capacity 200 pounds per load.

Other sizes built to order.

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STEEL
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STORAGE TANKS
for
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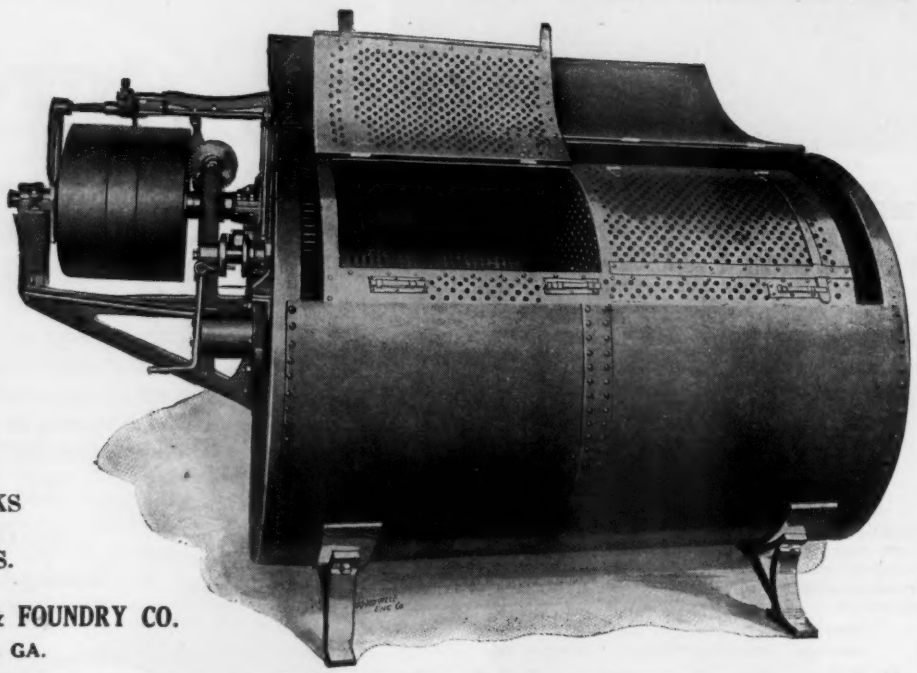

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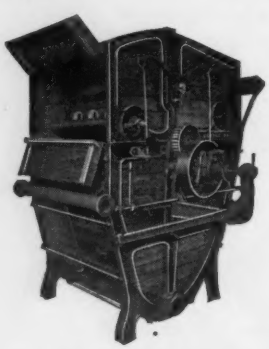

Every type of cotton fabric can be successfully handled in Rodney Hunt Washers. The slack loop method now in use on this machine turns out better-finished fabrics, without straining or over-stretching.

Our booklet No. 221 describes our Washers in detail. A postal to us will bring it to you.

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Tycos controls level and temperature in the size box—thus insuring uniform penetration of size. Steam is saved and over-boiling of the size box prevented.

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It's against the rules to allow most recording instruments to stray from a limited "working range." You must keep off the grass.

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Manufacturers are forced to make such rules because of the inherent weakness of the actuating movements of their instruments.

When the Foxboro Improved Helical Tube Movement was perfected 2½ years ago Foxboro Recorders were immediately freed from such obsolete rules and restrictions.

Foxboro Recorders are not hobbled within a limited "working range."

Select a Foxboro Pressure Gauge or Thermometer with the scale range that's easiest to read.

Use it constantly at maximum range if you wish.

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Accuracy within less than 1% of total scale reading is guaranteed.

The Foxboro Improved Helical Tube Movement is a great achievement in recording instrument construction.

Rules required to keep less sturdy instruments in calibration do not apply to the Foxboro Movement.

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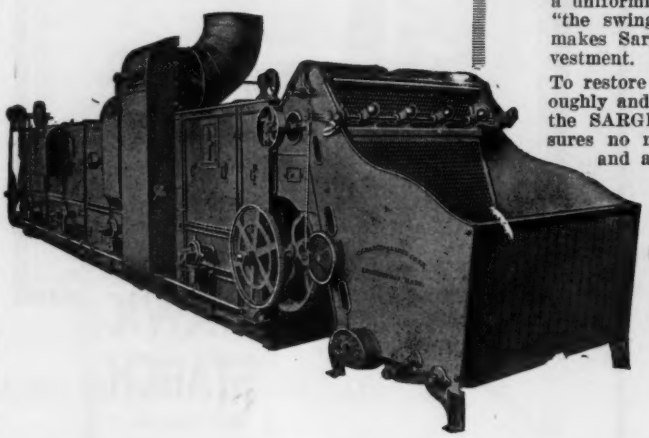

SARGENT DRYERS combine principles of air circulation and conveying that engineers and mill men have been quick to recognize.

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With such excellent features as cast iron frame, automatic feed, ball bearing fans, perfect circulation, rapid exhaustion and drying with a minimum temperature, a uniformity of results is obtained. A new feature, "the swingshelf conveyor," has been added, which makes Sargent Dryers even more of a valuable investment.

To restore the proper degree of moisture and thoroughly and uniformly condition your yarn, remember the SARGENT Yarn Conditioning Machine. It assures no more "Kinky Filling"—a thorough, rapid and accurate conditioning of your filling yarn.

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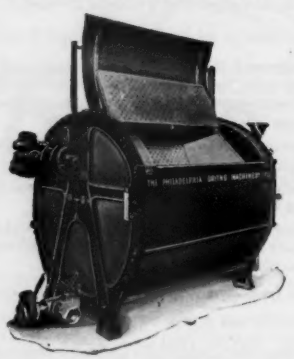

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This machine represents the latest development in the Hosiery Field. The tub and cylinder both being constructed of monel, permits easy cleaning of the machine and also allows the dyeing of various shades of colors.

The well-known "Hurricane" type of pocket and reversing mechanism is embodied in this machine as in our various other types. Built in 50 to 300 pound sizes.

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Staley's starches are made to your specific requirements.

Each formula is based on exact, scientific analysis of your individual production problems, by our technical and chemical engineering staff.

Equally advanced manufacturing facilities assure the precise maintenance of original quality in each shipment.

That is why Staley starches hold first place throughout the textile industry; why their record for results is unsurpassed.

You, too, can benefit by Staley methods. Our consulting staff is at your service.

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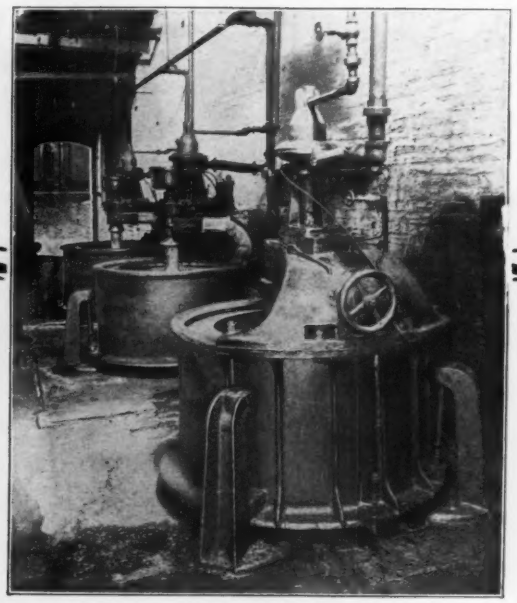

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Ask for sample. The product will prove itself.

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Prevents waste and saves time

Softens the Thread and lays the Fibre, and produces a Fine Lustre.

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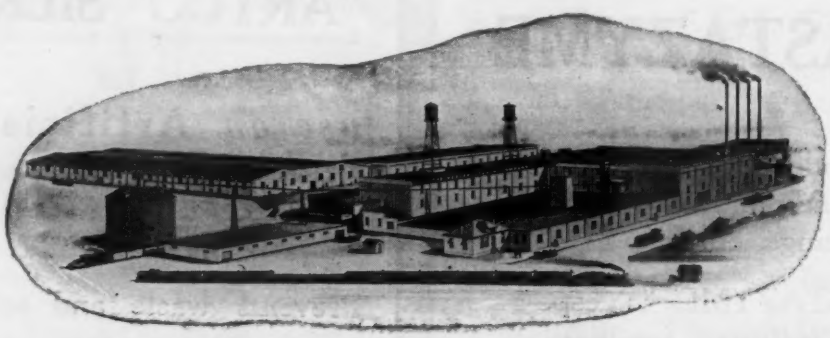

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It boils thin—it penetrates the warps—increases breaking strength and carries the weight into the cloth. Being thoroughly washed free of gluten and other foreign matter it gives a bleach and finish to the goods that you can get from no other starch.
A trial order will convince you that VICTOR STARCH has no equal on the market.

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A small trial order will convince you of the superiority of these perfect cloths. Ask for samples and prices.

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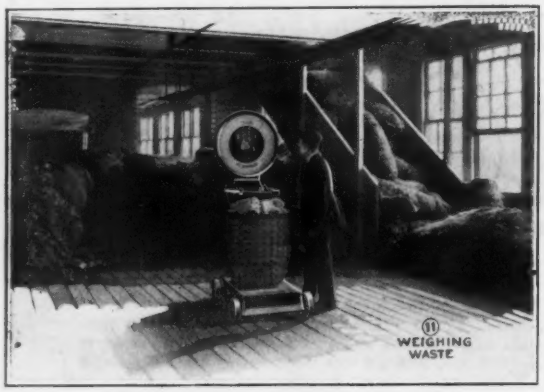

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Constucted entirely of the highest quality rust-resisting steel. Finished in Olive Green or Gray Baked Enamel.

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ROUGH HANDLING

No matter how short a distance or how far you ship your goods, the containers are subjected to a certain amount of rough handling.

Goods packed in HIGHTOWER Wooden Packing Cases stand the roughest handling without the slightest injury to their contents. In shipping your goods in these superior cases you get maximum protection at minimum cost.

Just Exactly Right

HIGHTOWER Cases are light in weight, thus reducing freight expense—and the interlocking reinforcement feature makes this box unparalleled for strength. They will carry heavier materials and are harder to pilfer and break open in transit.

Just the case for the textile industry. May we have your inquiry for full details and prices!

HIGHTOWER BOX & TANK COMPANY
ATLANTA, GA, BIRMINGHAM, ALA.

HIGHTOWER WOODEN PACKING BOXES

LOGEMANN
BALING-PRESSES

For Waste—

Hand-operated Balers—
Deep-box power Balers—
Hydraulic Balers—

For Finished Goods—

Hand-operated Balers—
Power toggle-lever Balers—
Hydraulic high-density Balers—

For Yarns—

High-density power Balers—

There is a LOGEMANN baler for every purpose.

Write for details specifying your needs.

LOGEMANN BROTHERS CO.
3102 BURLEIGH ST. MILWAUKEE, WIS.

Guaranteed Textile Brushes

PERKINS PRACTICAL BRUSH

ATLANTA BRUSH COMPANY

VALUE

How to gauge Brush value has always been a hard question for the buyer to solve. For instance, you go into a drug store to buy a nail brush or a hand brush; they are priced possibly from 10 cents to two dollars and fifty cents. The question is not so much the cost as the value you will receive for what you pay.

We have solved the problem of Brush value in textile Brushes. We make good brushes, price them right, and then guarantee them to give you the service **you** think they should give you.

ATLANTA BRUSH CO.
ATLANTA, GA.

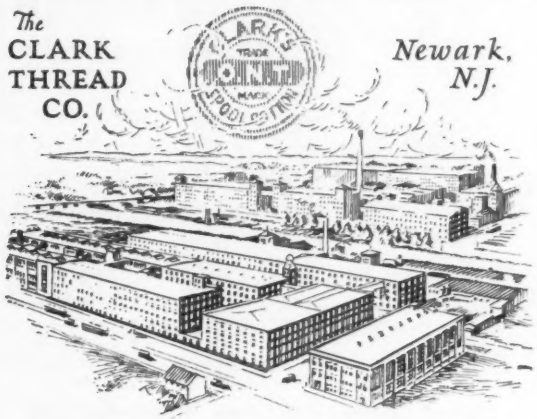
ATLANTA BRUSH COMPANY

A BRUSH FOR EVERY TEXTILE NEED

Electric Scrubbing!

Requires Less Time and Labor

The CLARK THREAD CO. *Newark, N.J.*



Nationally known institutions in the textile field are one by one reaching the conclusion that the only practical, economical way to keep floors clean is with Electric Scrubbing. The FINNELL System is now in regular use in the mills of the Clark Thread Company at Newark, N. J.

Electricity has proved itself better, faster and cheaper than hand work in so many ways—surely it ought to replace such drudgery as hand-and-knee scrubbing.

There is a right sized outfit for any size mill. And among the three hundred and more textile mills now using *Finnell* Equipment you will find plenty of evidence that its use will pay you.

FREE BOOKLET

"Electrical Scrubbing" will be mailed to any executive on request. Ask to see our motion picture demonstration. One of our Scrubbing Engineers will gladly show it. No obligation to you.

AMERICAN SCRUBBING EQUIPMENT SALES COMPANY

District Offices in Principal Cities.

53 COLLIER STREET HANNIBAL, MISSOURI

FINNELL SYSTEM

OF ELECTRIC SCRUBBING

"Clean Floors Reflect Clean Business"

MURDOCK
WATER SERVICE

Patented

OUTDOOR BUBBLE FONTS
are used on
PLAYGROUNDS
throughout the United States.

Made for outdoor service. They are the outcome of over 70 years of cumulative water service knowledge.

The only drinking fountain that will not freeze and burst. Practically everlasting in life and performance. No digging up after once installed.

FOOL PROOF

Write for Booklet "What an Outdoor Drinking Fountain Should Be."

YARD HYDRANTS, FIRE HYDRANTS, INDOOR DRINKING FOUNTAINS, HOSE BOXES

The Murdock Mfg. & Supply Co.
CINCINNATI, OHIO
Makers of Outdoor Water Devices since 1853

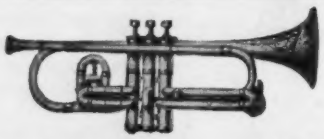
"Sonoco" Cones

Convolute Tubes and Winding Cores
Produce Handsome Packages

They are made by *Exact Automatic Methods* and are as interchangeable as any part of the machines on which they are used. They wind *evenly* with *equal tension* and *unwind just as perfectly.*

[If you have Friction-Driven Winders send for Samples of the New Cushion Cone]

Sonoco Products Co., Mfrs., Hartsville, S. C.
Eastern Office, 410 Olympia Building, New Bedford Mass.



A Band Helps to Make Contented Workmen

INDUSTRIAL bands are a great force for good—welding a body of employe's together, inspiring loyalty, providing amusement and recreation and actually speeding up production.

Conn will Help You Organize

We've helped to organize and have equipped hundreds of bands—our experience is at your service, without obligation. Conn instruments, easy to blow, beautiful in tone, perfect in scale, reliable in action—ideal for beginners as well as professionals.

Write today to

JOHN PHILIP SOUSA *uses and endorses Conn instruments.*

C. G. CONN, LTD.
315 Conn Bldg., Elkhart, Ind..

Our attractively illustrated catalog is yours for the asking.

Keeping Workers Fit For a Real Day's Work

Just as your machinery—accurate tools—need daily attention to insure dependable production—so do your workmen need to be kept fit. They need water—plenty of fresh cool water. It is an aid to production.

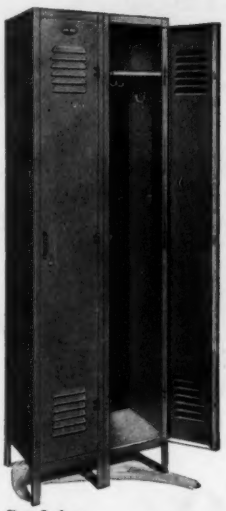
Keep your production up by keeping your workmen fit. Install R-S fountains—they're sanitary. The "Vertico-Slant" eliminates every element of danger from contamination. Because, lips cannot touch the nozzle.

Write today for information on the R-S fountains with metal body coolers.

Rundle-Spence Mfg. Co.
57 4th Street, MILWAUKEE, WIS.

R-S "Lips can't touch the R-S nozzle" R-S

DURABILT
STEEL LOCKERS AND CABINETS



Send for Locker Circular 5008

Designed for Hard Service
Built of Finest Materials
Finished with Care

Exclusive Features

1. Concealed one-piece, automatic Latching device.
2. Straight-Lift, stamped-steel (not cast) Handle.
3. Five-knuckle, full-looped, double-wear "strap" Hinges.
4. Scientifically reinforced rigid door.
5. Extra heavy, countersunk riveted Door Frame.
6. Unusually large Ventilating Louvres.

"No Better Built than Durabilt"

We are qualified by experience to render real assistance on your requirements. Write us at Aurora. Your inquiry will be referred to the Sales Office nearest you.

Send for Cabinet Circular 5009

Durabilt Steel Locker Co., 420 Arnold Ave., Aurora, Ill.

Sales Offices in all Principal Cities.

SAVOGRAN
THE STANDARD FLOOR CLEANER SINCE 1875

The Industrial Cleaner

The unsightly appearance, inconvenience, and danger of oily, dirty and slippery floors has been splendidly overcome by the use of SAVOGRAN.

Used where owners take pride in the cleanliness of their large floor spaces.

Textile Mills of national repute in every part of the country have found that SAVOGRAN cleans clean—and at a minimum expense.

It cleans in less time—saving labor.

It does more work per ounce—saving money.

It kills obnoxious odors thereby destroying sources of disease—saving lives.

It gives satisfaction—saving trouble.

For results and economy use SAVOGRAN.

The Well Built Cleaner

SAVOGRAN is made of only the purest materials. All raw stock is carefully analyzed to make sure the high standard of quality is maintained. It is this uniform excellence that has made SAVOGRAN the best cleaning powder for nearly half a century.

Every bit of it is soluble. No inert fillers, to cheapen the price and increase the weight, are used.

It is a dry powder—only a small amount is needed to do the work as it is not made bulky with moisture.

It does not deteriorate and lose its cleaning strength.

On account of the scientific blending of ingredients it will not injure the surfaces or harm the cleaners' hands.

All the above added to the fact that SAVOGRAN has stood the test of time, guarantees it to give satisfaction, economy and best results.

INDIA ALKALI WORKS

"Ask Your Supply House"
or write direct.

BOSTON **28-37 India Wharf** **MASS.**

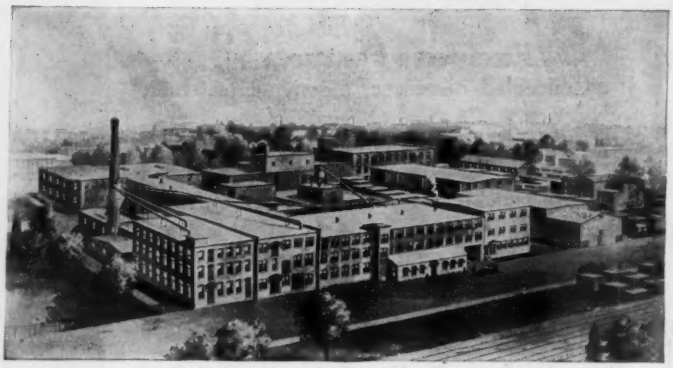
Bobbins Spools Skewers
Tubes Rolls
Manufacturers and Enamelers

OUR CUSTOMERS SAY

The careful attention that we give to the manufacture of their requirements means a stronger and more reliable Bobbin for them, while to us it means repeat orders.

We put all styles of reinforcements on Bobbins and Spools for conditioning of yarns.

All Bobbins enameled by our own process.



OUR PRODUCTS WHATEVER YOU USE WE MAKE

For service and prompt attention write us.

Walter L. Parker Co.
Lowell, Mass.

THIS Magazine is a product of our plant.

OF more interest to you however, is the fact that we are equipped to handle anything which you may need in the printing line. We make a specialty of the "Better Class of Blank Books and Mill Office Supplies."

THE
A. J. SHOWALTER CO.
Dalton, Georgia
"The House of Better Service and Prices"

Now—
You Can Save Money On Baskets

We know it's just the thing you have been looking for, and we have put forth our every effort in the construction of SMITH'S 100% Better Baskets to make them come up to your expectations. Heretofore, when your baskets became worn and useless you were forced to discard them and buy new baskets—not so with SMITH'S 100% Baskets. When this basket is apparently ready to discard, you simply slip on a new canvas cover,—the sturdy frame construction of steel, is practically indestructible and has cross slats and skids of wood.

SMITH'S 100% Baskets most efficiently fill your needs for the best doff baskets, storage baskets and distributor baskets. Light in weight, yet they stand rough handling without injury. They last a lifetime.

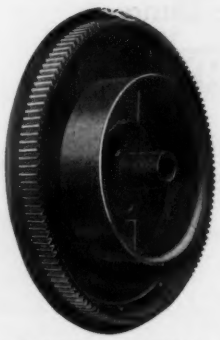
May we have your inquiry for prices?

SMITH MFG. COMPANY
DALTON, GA

SMITH'S TRADE **100%** MARK
BETTER BASKETS

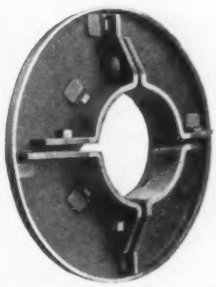
All Steel Loom and Section Beam Heads

Cannot Break
Do not Bend



"ALL STEEL" LOOM BEAM HEAD
"MALLEABLE" GEAR
PATENT PENDING

"ALL STEEL" SECTION BEAM HEAD
PATENTED



"ALL STEEL" ADJUSTABLE HEAD
SPLIT OR SOLID TYPE
PATENT PENDING

DUPLICATE YOUR CAST IRON HEAD IN STEEL—ELIMINATE ALL BREAKAGE
MAKE YOUR BEAM HEAD INVESTMENT PERMANENT

Mossberg Pressed Steel Corporation

Attleboro, Mass.

ALLEN COMPANY

Allen Company Products, tried under your own conditions, will prove profitable investments. Catalog showing the complete line gladly furnished on request. Ask for it today.

COMBINATION SECTION BEAM

The Combination Section Beam has met requirements long demanded in that it is stronger, reduces loss from bent shafts, and is better adapted for storage and shipping of yarn. It is stronger, being built around the pipe and not the shaft itself. Inner heads, being driven on pipes under great pressure, are thus secured without use of wedges or metal flanges. Staves of barrels are fastened to inner heads by countersunk screws. Heads are held on barrels by means of stay-bolts, passing through entire length of beam. Leverage on heads is lessened in so much as point of contact with beam is farther from center. Shaft passes through pipe, is accurately centered and held in pipe by taper nuts. If bent, release nut, remove shaft, straighten, then return to pipe. By removing shaft, loaded beams can be stood on end, making great saving in space for storage. Furnished complete with shaft, and can be used with either wooden or metal heads.

ALLEN COMPANY, NEW BEDFORD, MASS.

Also Manufacturers of
Wooden Beam Heads, Section Beams, Loom Beam Heads, Top Beams Beam Trucks, Box Trucks, and other wooden specialties
Southern Representative: Carolina Specialty Co., Charlotte, N. C.

For those of you who did not attend the Textile Show

It was too bad that you missed the many new ideas and improvements that have been developed since the last show.

At "Shuttle Headquarters" for instance, there was an unusually interesting display of Shambow "Custom Built" Shuttles.

They created much favorable comment.

But, because you did not see them at the show is no reason why you shouldn't have an opportunity to see them.

We are prepared to send you a man who will show you shuttles and weaving devices of great interest to you. He is a Shuttle Engineer and should you require it, he is fully capable of redesigning your present shuttle or designing an entirely new model for you.

This expert service won't cost you a cent and may save you much money. Just sign and mail the coupon or write us.

Shambow Shuttle Company
Woonsocket, R. I.

JOHN C. SHAMBOW, Pres. & Treas. H. H. ULLMAN, V. Pres. & Gen. Mgr.

Philadelphia 42 421 Bulletin Bldg. Paterson, N. J. 245 Straight St. Greenville, S. C. Southern Factory

COUPON

SHAMBOW SHUTTLE CO., Woonsocket, R. I.

We will be interested to learn more about the new shuttles, tensions, threaders and other devices without obligating ourselves in any way.

Company .....

By .....

Address .....

.....

SHAMBOW MAKES
shuttle bills smaller
interruptions fewer
production greater
products better

MORE
SOUTHERN SPINNERS
are using

AMTEX TRADE MARK REGISTERED

SPINNING, TWISTING AND SPOOLER TAPE
Than ever before

This increasing demand indicates the superiority of AMTEX Tapes over all others.

We are pleased to build special Tapes for your particular needs.

Send us your specifications and we will guarantee satisfaction.

Manufactured by

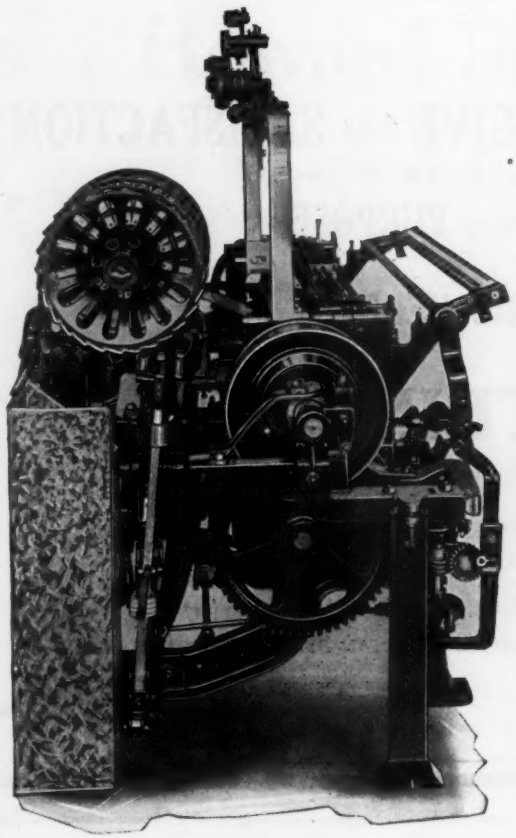
AMERICAN TEXTILE BANDING CO., INC.
GERMANTOWN, PHILADELPHIA, PA.
Sold in the South by
Charlotte Supply Co., Charlotte, N. C.
Wilson Company, Greenville, S. C.

AMERICAN
SUPPLY COMPANY
PROVIDENCE, R. I.

Manufacturers of

LOOM HARNESS,
WEAVING REEDS,
OAK TANNED LEATHER
BELTING, STRAPPING,
ETC.

We make a specialty of Harness for Warp Drawing Machines



The Latest

NORDRAY

Automatic Loom

Multiple-harness, Feeler type

built by

HOPEDALE MANUFACTURING CO.

at MILFORD, MASS.

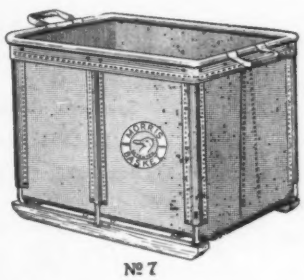
SOUTHERN OFFICE at
GREENVILLE, S. C.

This loom was shown at the Late Greenville Exposition and excited great interest.

It is Still the Simplest.

Is your BASKET TRANSPORTATION EFFICIENT?

It is if you use Morris Duck Baskets. Service is never interrupted by sagging, broken-down receptacles—goods are never damaged—where these sturdy, long-lived baskets are installed.



№ 7

Morris Duck Baskets take knocks and blows without flinching— give equal protection to heavy or delicate materials. Frames of Round Spring Steel give strength—tightly woven cotton duck (canvas) coverings impart necessary flexibility. Your choice of wood or steel runners.

№ 19

There is a Morris Duck Basket for every mill requirement—each one a master in its class.

Send for booklet which shows how to make your basket "line" pay dividends. Prices gladly furnished.

MORRIS & CO., INC.

15 Chestnut Street

Groveville, N. J.

SELECT THE HEDDLES WHICH GIVE YOU SATISFACTION

A HEDDLE FOR EVERY PURPOSE

SWISS TWIN WIRE HEDDLES

J. J. REUTLINGER

160 FIFTH AVE. NEW YORK

Southern Representative:
RALPH M. LANE,
P. O. Box 1375, CHARLOTTE, N. C.

Eastern Representative:
A. J. SCHULLER,
163 MERIDIAN ST., EAST BOSTON, MASS.

Cost

may be a primary consideration

The Liberty Knotter

not only fills the requirements of low first cost but is most simple in construction and economical in upkeep and operation. Give it a trial.

Guaranteed for one year

Write for information

A. B. CARTER, Sales Agent,

Gastonia, N.C.

Mill Devices Co. Durham, N. C.

The Palmer Adjustable Thread Guide

For Ring Spinning and Twisting Frames

Easily Adjusted.

Extreme accuracy and permanence of setting.

Cheapest of them all.

Mail guide-block for free sample.

Patented and manufactured by

THE I. E. PALMER COMPANY

Middletown, - - - Connecticut

Howard Bros. Mfg. Co.

ESTABLISHED 1866

Home Office and Factory, Worcester, Mass.

Southern Branch Factory — *121 South Forsyth St., Atlanta, Ga.*
Southern Branch Office — *1126 Healey Bldg., Atlanta, Ga.*
E. M. TERRYBERRY, Southern Agent — *G. L. MELCHOR, Asst.*

Cylinder and Doffer Fillets
Napper Clothing

Stripper and Burnisher Fillets
Emery Fillets

Top Flats and Lickerins Recovered and Promptly Returned

Tempered Steel Twin and Domestic Iron Wire Heddles
The Best Materials Obtainable Make Up Our Products

Give us a trial on Cylinder and Doffer Fillets. This will satisfy you as to the merits of our Card Clothing.

The Product of Shuttle Specialists

Not the least of the reasons for the dependable performance of Williams' Shuttles is the excellent workmanship that goes into them. They are turned out by well-paid men who thoroughly know the ins and outs of correct shuttle construction. Moreover these men appreciate the mill man's viewpoint. The result is a shuttle that coordinates perfectly with the rest of the loom.

What are *your* shuttle difficulties? Our staff of experts have helped many textile men to better their loom production. Feel at liberty to consult us without the slightest obligation on your part.

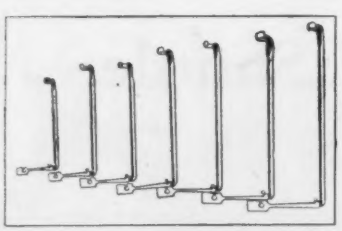
The J. H. Williams Company

"THE SHUTTLE PEOPLE"

MILLBURY MASS.

GEO. F. BAHAN, SOUTHERN REPRESENTATIVE, CHARLOTTE, N. C.

THE
WHITINSVILLE
SPINNING RING CO.
WHITINSVILLE, MASS.
SPINNING RING
SPECIALISTS
ESTABLISHED OVER FIFTY YEARS
DIAMOND FINISH



REMEMBER

PRODUCT . . . .FLYER PRESSERS
All efforts concentrated on one product.

POLICY . . . . . .STANDARDIZATION
Greater efficiency and lower cost.

MAKE . . . . . .BEST POSSIBLE
Longer service means satisfied customers.

MATERIAL . . . .NORWAY IRON
Because only Norway Iron can make a satisfactory Flyer Presser.

QUALITY . . . . .THE HIGHEST POSSIBLE

PRICE . . . . . .THE LOWEST POSSIBLE

Southern Spindle & Flyer Co., Inc.

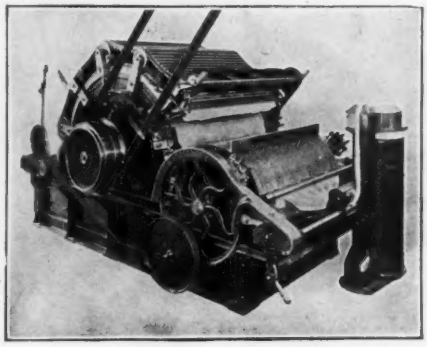
"We Manufacture
Overhaul and Repair Cotton Mill Machinery"
Charlotte, N. C.

W. H. MONTY,
Pres. and Treas.

W. H. HUTCHINS,
V. Pres. and Secy.

Growth A Tribute To Worth
1883
THE reputation of our "Superior" quality products established forty years ago has been maintained through the years, until today our "High Grade" products are demanded and used by the leading textile mills throughout the entire country. The combined organizations at the main plant in Lawrence, Mass., together with three big stock plants in Maine, New Hampshire and Vermont, altogether operating hundreds of skilled workmen, each one of whom takes pride in upholding the reputation established forty years ago, assure textile mills of the most dependable and economical products of their kind to be obtained.
We specialize in complete new mill equipment of Bobbins, Spools, Shuttles, Skewers, etc.
Our "High Grade" Products include:—Plain and Automatic Loom Shuttles, Warp Bobbins, Filling Bobbins, Card Room Bobbins, Plain and Metal Head Warper and Twister Spools, Automatic Loom Bobbins, etc. We particularly call attention to our bobbins and spools fitted with our special metal shields of all types and kinds, also to our enamel finish in any color.
THE DAVID BROWN CO.
"High Grade" Bobbins, Spools and Shuttles
LAWRENCE, MASS.
1924
GOLD MEDAL
SILVER MEDAL
The David Brown Co.
Lawrence, Mass.

SACO-LOWELL
TEXTILE MACHINERY



INCLUDING

REVOLVING FLAT CARDS

Our cards are designed to meet the various conditions found in different mills and will handle all lengths of staple from the longest Sea Island to the shortest waste stock. Especial attention has been given also to the elimination of air drafts which cause the web to be cloudy.

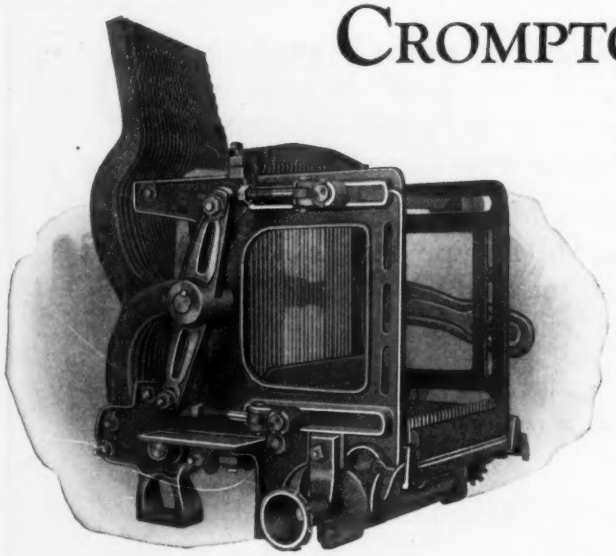
SACO-LOWELL SHOPS

SOUTHERN OFFICE
CHARLOTTE, N. C.

Branch Southern Office
Greenville, S. C.

Executive Offices:
NO. 1 FEDERAL ST.
BOSTON, MASS.

SHOPS
BIDDEFORD, ME.
LOWELL, MASS.
NEWTON UPPER FALLS, MASS.
PAWTUCKET, R. I.
CHARLOTTE, N. C.



CROMPTON & KNOWLES
DOBBIES

NEW FEATURES OF SPECIAL INTEREST TO WEAVERS AND FIXERS

1. We are now prepared to equip the dobby shown above with pressed steel hook levers (patented) and drop forged top and bottom hooks (patented).
2. Built with slotted fingers and locking rod (patented), making it easy to remove, clean, and replace the fingers.

We call attention to the carefully machined swivels and studs used for operating the dobby knives.

This dobby can be applied readily to any make or type of loom.

CROMPTON & KNOWLES LOOM WORKS
WORCESTER, MASS.

PROVIDENCE, R.I. PHILADELPHIA, PA. PATERSON, N. J.
S. B. ALEXANDER, CHARLOTTE, N. C., Southern Manager.

"Get Together"
At Philadelphia
April 7, 8, 9, 10 and 11

The 20th Annual

KNITTING ARTS EXHIBITION

Under the Auspices of
National Association of Hosiery and Underwear Manufacturers
at

Commercial Museum
Philadelphia
April 7 to 11

The Great Annual "Get Together" of the Trade—affording the retailer, jobber and manufacturer the opportunity for personal contact. Come to this great exhibition for new friends, new business and new ideas.

No manufacturer of Knitting Machinery, Knitted Underwear or Outerwear, Yarns, Mill Equipment or Accessories, should fail to exhibit their line at this great business-getting and business-building exhibition.

Application for space should be made at once, as remaining space is very limited.

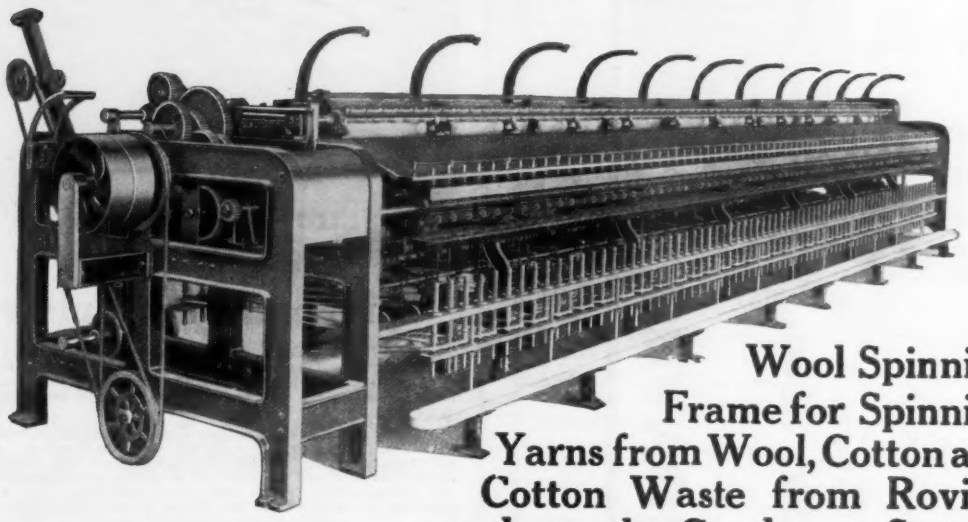
PERSONAL DIRECTION CHESTER I. CAMPBELL

Address all communications to Executive Offices
329 Park Square Building, Boston, Mass.

WHITIN MACHINE WORKS

ESTABLISHED 1831

TEXTILE MACHINERY



Wool Spinning Frame for Spinning Yarns from Wool, Cotton and Cotton Waste from Roving made on the Condenser System

MAIN OFFICE AND WORKS

WHITINSVILLE, MASS., U.S.A.

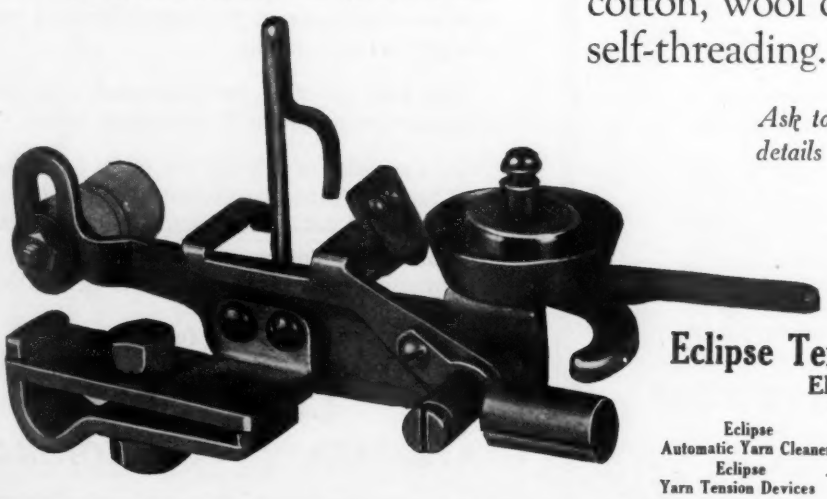
SOUTHERN OFFICE CHARLOTTE N.C.

ECLIPSE

Slub Catcher and Tension Device

WE offer for your consideration, a perfect Slub Catcher and Tension combined, which automatically adjusts itself to any size yarn—cotton, wool or silk. It is also self-threading.

Ask today for full details and prices.



Eclipse Textile Devices, Inc.

Elmira, N. Y.

Makers of

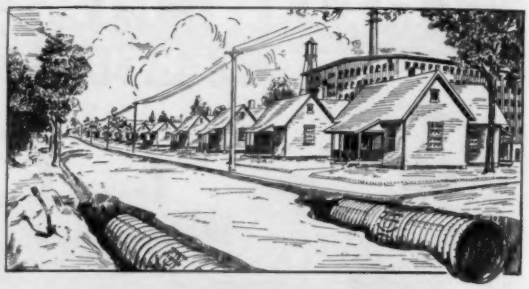
Eclipse Automatic Yarn Cleaners

Eclipse Automatic Stop Motions

Eclipse Yarn Tension Devices

Van Ness Random Dyeing Machines

You All Know This Box



The Village Street and Carolina Metal Culverts

The streets of your Mill Village are more than highways of transportation. They are the very arteries connecting the homes of many satisfied workers. With Carolina Metal Culverts to take care of all the drainage problems, you feel that they are off your mind for a long time to come.

Made of the best rust-resisting and anti-corroding Copper Steel, they guarantee long life and low maintenance cost. Carolina Metal Culverts cost LESS than other forms of drainage, are easily installed, can be removed or relaid without damage, and are indestructible. They meet every requirement of the State Highway Commission and the United States Government.

Whatever they are, solve your drainage problems with Carolina Metal Culverts.

Carolina Metal Culvert Company
Office and Works
SALISBURY, NORTH CAROLINA

For 42 Years

We have concentrated our efforts on roofing problems of all kinds. Our roofing experts are at your service in solving your problems, large or small. Satisfaction and economy, not only initially, but in the years to come, result from a roof applied by

"Dixie's Reliable Roofers"

Here are a few of the textile mills whose roofing problems have been solved by our specialists and whose roofs have been "Done by Murphy."

BIBB MFG. CO.
COVINGTON COTTON MILLS
MILL NO. 2 NEWNAN COTTON MILLS
MILL NO. 1 ANCHOR DUCK MILLS
WINNSBORO MILLS
SCOTTDALE MILLS
HILLSIDE COTTON MILLS
MILL NO. 1 AND NO. 2 TALLADEGA MILLS
ROYAL MILLS

You will not regret calling on us for quotations on

Gravel and Slag Roofing
Waterproofing, Insulated Roofs
Tar Concrete Floors

C. P. MURPHY'S SONS
Established 42 Years
ATLANTA, GA.

"Cotton Mill Machinery Calculations"

EVERY Textile Man should have these reference books. They cover in a detailed and thorough manner all calculations necessary to be made on any cotton mill machinery manufactured in the United States and constitute one of the best references on the subject obtainable.

The two volumes are illustrated with 45 diagrams and contain 21 reference tables.

As the value of a book lies in its contents and not in a fancy cover, we have put these two volumes out in a strong, serviceable paper binding. You can secure them free in conjunction with a subscription to COTTON.

Write for circulars and full information.

COTTON,
ATLANTA, GEORGIA

The Mark of Quality Fence and Service.

Cyclone Fence

PROPERTY PROTECTION PAYS

"GALV-AFTER"
Chain Link Fence Fabric

FOR years Cyclone Fence has been the standard of the world. It has represented the highest development in Property Protection fence.

Now Cyclone offers Property Protection Plus—"GALV-AFTER" Chain Link Fence Fabric—that brings new standards of durability; new economies in fence maintenance.

This new fence fabric is Heavily Zinc-Coated (or Hot-Galvanized) by Hot-Dipping Process AFTER Weaving. Ordinary fence is made from commercial wire "galvanized before weaving." Only a very light zinc coating is applied. Even this light coating cracks and breaks, leaving open spots for rust to attack.

With Cyclone "GALV-AFTER" Fence a zinc coating five times heavier is applied to the wire. It is uniform at all points and presents an unbroken armor against rust.

Cyclone Ornamental Fence for homes makes *the ideal* enclosure for company homes. Built in a variety of attractive styles and heights. Catalog on request.

We have prepared an interesting treatise on Cyclone "GALV-AFTER" Fence Fabric. We will send this to you on request, also complete information on Cyclone Service which solves all fencing problems. Write our nearest offices, Dept. 35.

CYCLONE FENCE COMPANY

Factory and Offices:

Waukegan, Ill.; Cleveland, Ohio; Newark, N. J.; Fort Worth, Texas; Oakland, Cal. (Standard Fence Co.); Portland, Ore. (Northwest Fence & Wire Works).

Zemco-lite

TRADE MARK

The Cement Paint

Zemco-lite
Lighting Effectiveness
A bright, correctly diffused white wall and ceiling is the first requisite when selecting a mill white,—and the lighting effectiveness of Zemco-lite is unequalled by that of any other paint made. This superior quality is due solely to the prismatic act of the tiny particles of white Portland Cement which diffuse light in myriads of directions, flooding the interior with a soft white glow that minimizes shadows, is absolutely free from glare, and cuts down lighting bills most effectively.
And Zemco-lite STAYS WHITE. There is no oil in it to discolor. It is so finely ground that it hardens into a semi-flat enamel-like surface that is too smooth to catch lint or accumulate dust. It is naturally unaffected by moisture, steam, water, or acid fumes.
Frankly the light-reflecting qualities of Zemco-lite will startle you, once you have it on your walls and ceilings. It is the one perfect mill white.
Many of the leading textile mills have adopted Zemco-lite as their standard wall coating.
American Cement Paint Co.
Chattanooga, Tennessee
Zemcolite is also made in a variety of colors for every kind of interior or exterior painting. Color card will be gladly sent on request.

Zemco-lite
Permanent Economy
The basis of the extreme economy of Zemco-Lite lies in the aggregate of pure WHITE Portland Cement. You build with cement for permanence—why not paint with cement? Zemco-lite is the practical, commonsense coating for walls and ceilings, for it possesses the same characteristics of the walls themselves and when applied sets and hardens as an integral part of the wall, and it never cracks or peels off.
Do not confuse Zemco-lite with "cold water paints" or calcimines which are all made of whiting or other pigments, blended with soluble glue. They bear no relation to Zemco-lite save in the manner of mixing. Zemco-lite comes in a super-fine white powder and is mixed with water just as concrete is mixed with water.
The initial cost of Zemco-lite is one-third the cost of liquid coatings and the cost of application is proportionately less, for one good coat well applied does the work, thus saving you not only good money in oil and mixed paints, but the labor and time in putting on the two or three coats required by liquid whites to secure satisfactory service.
In short Zemco-lite is not only the whitest white—but it stays white permanently and costs less, first and last.
If you are not among the many mills who are already using Zemco-lite, we want to ask you to give it a fair trial and let it speak for itself. May we send full details?
American Cement Paint Co.
Chattanooga, Tennessee
Zemco-lite, being a perfect non-conductor of heat, makes an excellent covering for steam pipes. It is the most economical means of minimizing losses from steam radiation.

Like Cement — It Improves With Age —

T-U-P-E-L-O

is a species of lumber that might well be said to be "grown to order" for

TEXTILE MILL FLOORS, PLATFORMS

and other places and uses where "wear and tear" must be expected and provided for. *Leave it to TUPELO!*

This Softwood Hardwood has an "involved" grain which keeps it from slivering or splintering. A TUPELO floor wears smooth because it wears little—always looks well, because TUPELO has a fine, white color and a satiny sheen.

We'll gladly tell you the whole, interesting story of TUPELO if you'll write and say "we're listening."? When? TODAY?

SOUTHERN CYPRESS MANUFACTURERS' ASSOCIATION

805 Poydras Building, New Orleans, La. or 805 Graham Building, Jacksonville, Fla.

(*Please address the office nearest you*)

Approximately 1,500,000 Barrels "Royal Cement" Shipped Into Southeastern States Last Year

DIXIE PORTLAND CEMENT CO. ROYAL CHATTANOOGA, TENN.

Is tested in our laboratory every 60 minutes. The quality of our product is only equaled by our service in the handling of large jobs.

DIXIE PORTLAND CEMENT CO.

CHATTANOOGA, TENN.

ELECTRICAL SUPPLIES

GENERAL ELECTRIC CO.'S PRODUCTS—MOTORS, WIRE, WIRING DEVICES, ELECTRICAL, PORCELAIN CONDUIT AND FITTINGS, TRUMBULL SWITCHES.

Complete Stocks in Columbia for Prompt Shipment.

DISTRIBUTING GE JOBBER

PERRY-MANN ELECTRIC COMPANY

COLUMBIA, S. C.

No Hold Ups!

IS TIME A FACTOR?

H. & G. field men are not often held up on account of delayed shipments of supplies, as are ordinary electrical contractors who have to depend on factory deliveries. There is a minimum loss of production due to hold-ups when the installation is being done by H. & G. for there is a reserve stock of material and supplies in the H. & G. warehouse ready for almost any emergency.

An organization of specialists in every phase of textile mill electrical systems, a large stock of supplies and equipment, and experienced field men back every H. & G. Trouble-Proof Electrical Installation and work together to furnish it when you need it.

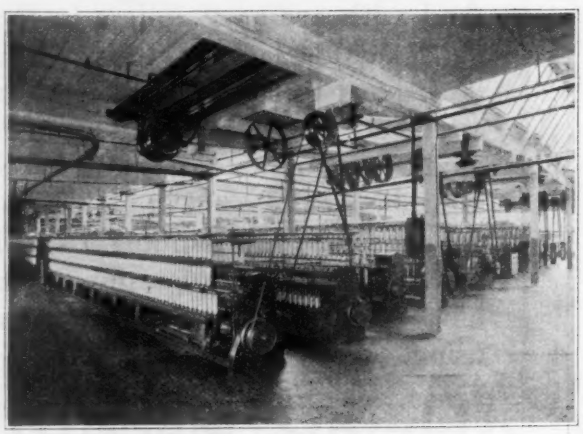
At Your Service.

HUNTINGTON & GUERRY, INC.
GREENVILLE, S. C.

HUNTINGTON & GUERRY TROUBLE PROOF ELECTRICAL INSTALLATIONS

H & G TROUBLE-PROOF ELECTRICAL INSTALLATIONS

Textile Motors



30 HP. 1200 R.P.M. AR Motor driving Fine Frames

Allis-Chalmers Standard and especially designed Type AR Squirrel Cage Induction Motors for the Textile Industry are built to fill all requirements. Designed for either floor or ceiling mounting they lend themselves to all applications. Their steel construction makes for an extremely rugged motor. Ventilation is very effective resulting in even cooling.

For detailed information, send for Bulletin.

ALLIS-CHALMERS PRODUCTS
Electrical Machinery
Steam Turbines
Steam Engines
Gas and Oil Engines
Hydraulic Turbines
Crushing and Cement Machinery
Mining Machinery

ALLIS-CHALMERS MANUFACTURING COMPANY

MILWAUKEE, WISCONSIN. U.S.A.

ALLIS-CHALMERS PRODUCTS
Flour and Saw Mill Machinery
Power Transmission Machinery
Pumping Engines-Centrifugal Pumps
Steam and Electric Hoists
Air Compressors - Air Brakes
Agricultural Machinery
Condensers

Electrical Service to Georgia

On General Electric Products

Our Atlanta and Savannah warehouses carry complete lines. Whatever your requirements — just so they are electrical — we can not only fill them, but insure prompt and efficient shipments.

We carry a particularly full line of textile mill equipment, illuminating units, lamps, motors, etc. Save yourself worry and inconvenience by drawing from our complete stock.

COMPLETE LINES OF

Wire
Conduit
Switches
Safety Devices
Fuses
Insulators
Lamps
Lighting Units
Fixtures
Fans
Street Lights
Motors
Brushes
Etc.
Anything Electrical

QUICK DELIVERY

CARTER ELECTRIC CO.

Distributors

ATLANTA SAVANNAH

FLEXCO

Lamp Guards

The Mill Type Guard

Illustrated above is the new FLEXCOLOCK Mill Type Lamp Guard.

This addition completes a line of re-enforced, expanded metal guards that is superior in service, appearance, safety and proper distribution of light.

If your jobber cannot supply you, a letterhead request will bring sample and prices. (Give lamp size and socket diameter next to or between shade holder rings.)

FLEXIBLE STEEL LACING CO.
4619 Lexington St., Chicago, U. S. A.

"DETROIT" BELT LACING is Still The Cheapest By Far

Ask any of our 10,000 users. Another important fact to remember is that

"DETROIT"

IS the only Wire Hook Belt Lacing that takes a staggered grip on the Belt.

Let us prove it by sending X-Ray photographs, they tell the inside story.

Free Proof of Detroit Superiority

Reports of special investigations of Detroit Belt Lacing made by Gould & Company await your card or letter. They may help you reduce your belt lacing cost.

"After a thorough study of different methods of lacing belts, we have standardized on Detroit Belt Lacers and hooks. Detroit lacings average 1½ years' life, Detroit clips never pull out, and the Detroit method pays for itself every 34 days."

THE WILLYS-OVERLAND CO., Toledo, Ohio.

DETROIT BELT LACER CO.
DETROIT, MICHIGAN, U. S. A.
Branches in large cities—Licensees in foreign countries.

Stretched Laps Make Poor Work

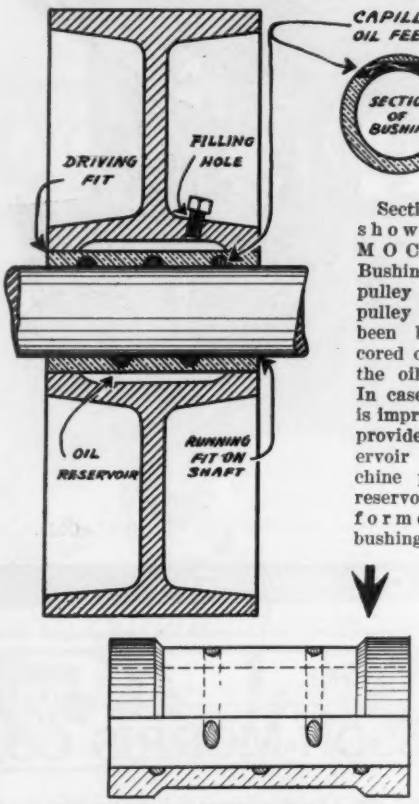
And with ordinary rollers in the lap heads on lappers, the lap rod is so hard to turn that the lap is stretched by pulling hard enough on it to cause it to turn. Ball bearing rollers can be put in your present heads in a few minutes at small cost. Send us an order, giving the kind of lap heads you are now using.

AldricH MachinE Ball WorkS Bearings

Greenwood, S. C.

MOCCASIN SELF-OILING BUSHINGS

Were originally designed for use in loose pulleys. Require oiling only twice a year. Prevent damage to belting, floors and stock.



Sectional view showing the MOCCASIN Bushing in a loose pulley where the pulley hub has been bored or cored out to form the oil reservoir. In cases where it is impracticable to provide an oil reservoir in the machine part, the reservoir may be formed in the bushing itself.

Has Been Running Over Seven (7) Years On Average of Less Than Two Oilings A Year.

"We have in our machine shop a wheel grinder with 12" x 4½" pulley on counter shaft running at high speed. The loose pulley on said shaft always gave us a lot of trouble by heating up and making such a terrible racket that we had to throw belts off as soon as we got a job completed. It was always impossible to maintain bushings in said pulley for any great length of time.

In October, 1916, we equipped these countershafts with MOCCASIN BUSHINGS which eliminated our trouble and are running just as smooth today as when they were installed seven years ago.

We also find that they are very saving on oil.

Below is a record of oiling periods which is remarkable.

Installed and oiled Oct. 12, 1916.

Oiled Mar. 1, 1917	Oiled May 25, 1919	Oiled Mar. 27, 1922
" Nov. 24, 1917	" Nov. 20, 1919	" Jan. 2, 1923
" Apr. 1, 1918	" Apr. 11, 1920	
" Sept. 15, 1918	" Jan. 3, 1921	

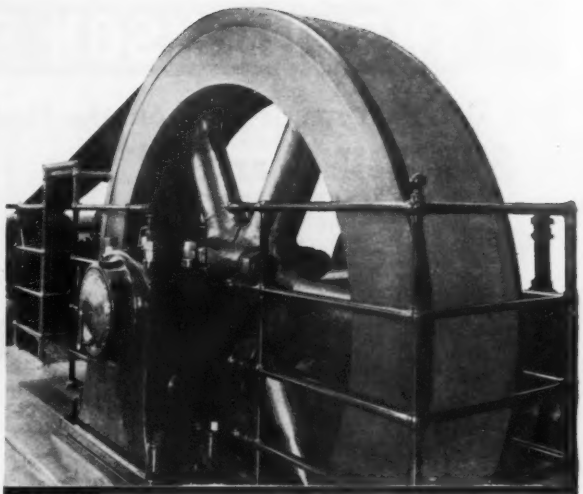
This shafting is run 54 hours per week.

(Signed) Union Street Railway Co.

Write for Full Particulars.

MOCCASIN BUSHING COMPANY

CHATTANOOGA, TENNESSEE



From no load to 25% overload almost instantly

IN A LARGE mill in Salt Lake City a new belt was put on the main drive—a drive on which the load jumped from practically no load to 25 per cent overload almost instantly.

A written guarantee went with this new belt. *But it was in service less than thirty days.*

Then a Graton & Knight Leather Belt was installed, and this is what the general manager writes about its performance:

> "This is a very hard drive, the load going from practically no load to 25% overload almost instantly, causing a certain amount of slippage which destroyed the previous belt. The engine driving this mill is a 700 nominal horse-power, and with this 25% overload causes a severe strain on the belt, but SPARTAN (one of the Graton & Knight Standardized Series Belts) is taking care of this in a most satisfactory manner, and to say that we are more than pleased with this belt is putting it very mildly."

Among the Graton & Knight Standardized Series of Leather Belts there is one that will meet the requirements of your present belting problem. Through years of analyzation of power transmission requirements we have developed this series of belts —*a standard belt for every transmission job.* Belting economy—the case of the mill quoted above is one in hundreds—is the result.

The book "The Standardization of Belting" tells the whole story of the Graton & Knight Standardized Series. Write for it and at the same time let us know the type of transmission you are most interested in.

A Graton & Knight engineer will gladly consult with you in the solving of your transmission problems, giving you the benefit of the widest belting experience in the world.

GRATON & KNIGHT

WORCESTER, MASS.

GRATON & KNIGHT

Nothing takes the place of Leather

THE JOHNSON FRICTION CLUTCH

In a Double Type as Used on the New Era Model Spotless

SPONGING and SHRINKING MACHINE

Double Clutch Exterior.

This Spotless Shrinker Co. machine is in use at Hart Schaffner & Marx, the Stein Bloc Co., and many other well known clothing manufacturers.

A No. 2 Johnson double clutch is installed in the gear box and is used to drive the roll while the cloth is passing over the steam heated tubes. Spur gears are mounted on clutch hubs to give two speeds—one forward and one reverse.

Textile machinery requires a reliable and powerful clutch. The Johnson clutch has been tried by the leading textile machine manufacturers and adopted on its merit for many machines. The most of these machines are of special design for a particular purpose and therefore cannot be given publicity. Let us work out your problems. Write for Catalog "G."

Courtesy: *The Spotless Shrinker Co.*, Cleveland, Ohio.

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

TANNATE'S TRACTIVE GRIP

MANY of you textile men use Rhoads Tannate Cone Belts because they help you to better and larger output. Tannate Leather carries 20% more load than best oak.

If you have any particularly troublesome drive try Tannate on it. If it does not give you greater output, fewer take-ups and last longer than belts you are using, send it back to us and we'll refund whatever part of the purchase price you say is right. This is our guarantee under which you buy the belt. Give us a chance at it, the risk is ours.

USE RHOADS LEATHER BELT PRESERVER ON ALL LEATHER BELTS. THEY WILL PULL MORE AND LAST LONGER.

J. E. RHOADS AND SONS

PHILADELPHIA: 29 N. SIXTH ST.
NEW YORK: 96 BEEKMAN ST.
CHICAGO: 316 W. RANDOLPH ST.
ATLANTA: 67 S. FORSYTH ST.
FACTORY AND TANNERY: WILMINGTON, DEL.

CRESSON-MORRIS CO.

POWER TRANSMITTING MACHINERY

Merit Plus Recognition

"The heights by great men reached and kept were not attained by sudden flight."

Time, skill and effort must also precede merit as surely in machinery as in men.

Time, skill and effort must also precede merit in order to obtain and maintain for merit the recognition it deserves.

The great number of large installations of Cresson-Morris Power Transmitting Machinery is proof of both the merit and the recognition of the merit that nearly three score years of skill and effort have endowed it with.

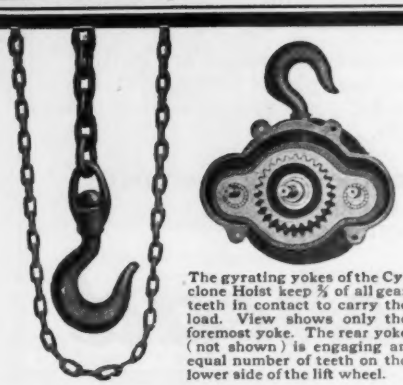
The cumulative knowledge of all this experience is always available to you in the recommendations of our engineers.

CRESSON-MORRIS COMPANY

ENGINEERS—FOUNDERS—MACHINISTS

PHILADELPHIA, PENNA.

CYCLONE HOISTS
HIGH SPEED



The gyrating yokes of the Cyclone Hoist keep ⅔ of all gear teeth in contact to carry the load. View shows only the foremost yoke. The rear yoke (not shown) is engaging an equal number of teeth on the lower side of the lift wheel.

—carry the load on more teeth!

WE show above a cutaway view of a portion of the lifting mechanism so that you can see at a glance how the gyrating yoke of a Cyclone Hoist means a safer, stronger hoist, and minimizes vibration and wear.

The gyrating yoke is a patented engineering improvement found in no other hoist but the Cyclone. *Its peculiar gyrating motion keeps two thirds of the drive and lift gear teeth in contact at all times.*

You'll get faster, smoother, easier lifts and longer service from a Cyclone.

Distributors Everywhere. Send for catalog covering 1 to 40 Ton Hoists, Cranes, Trolleys, and Overhead Track Systems.

The Chisholm-Moore Mfg. Co.
Cleveland, O.

Branches: New York, Chicago, Pittsburgh

Hoists Cranes Trolleys
Overhead Track Systems

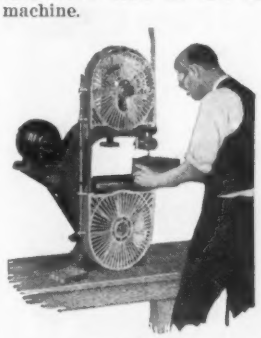
Taking the "Hack" Out of Hack Saw

Racine High Speed Metal Cutting Machines have taken the "Hack" out of Hack Saw. They cut with a scientific draw stroke. The positive lift prevents any possibility of the saw dragging on the non-cutting stroke. Blades stay sharp and last ten times as long. Cuts are clean; no special attention is required to work to 0.01 inch limits.

There is a Racine H. S. Metal cutting machine for every metal cutting requirement.

Racine High Speed Metal Cutting Machines

Cut more accurately, much faster and at far less cost than any other machines on the market.
Send for a sample from six-inch stock and see the accurate work done on this scientifically designed cutting machine.



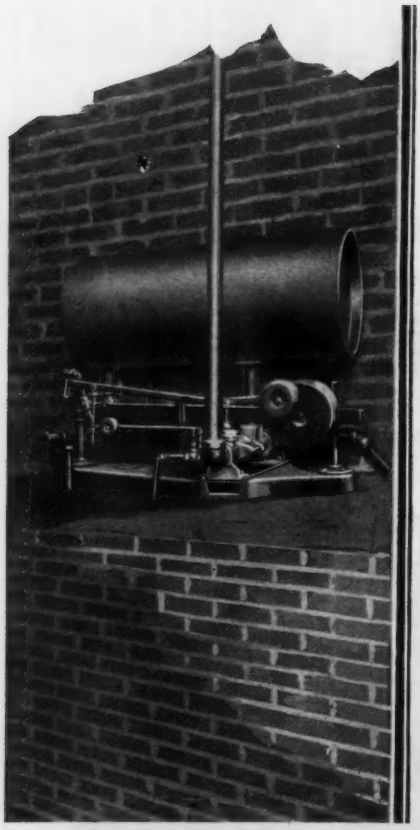
RACINE DUPLEX BAND SAW

Built to cut every material, wood, soft metal or steel. Two speeds, ball-bearing mounted wheels are vibrationless, — saws will not crystallize, a machine that is cutting costs for dozens of manufacturers. Let us send you our bulletin—better yet, arrange for a demonstration.

Use "Racine" H. S. Wood and Metal Band Saw Blades and "Racine" H. S. Tungsten Power and Hand Hack Saw Blades.

RACINE TOOL & MACHINE CO.
1309 JONES AVE., RACINE, WIS.

"STANDARD THE WORLD OVER"



Condensation Can Be Conquered

Condensation running wild is the arch-enemy of the textile mill. Collecting in dryers, slashers, service heaters and other steam heated apparatus it cools the equipment, steals fuel and reduces output.

But condensation can be conquered. Drain it with a Morehead Back-to-Boiler System and it will be a nuisance no longer. Your steam lines and spaces will be open and clean,—your equipment will be much hotter and more productive. You can save the valuable heat units in the condensation, for a Morehead System will feed it to the boiler at the high temperature of condensation.

Several thousand Morehead Systems are putting new life and economy into plants throughout the country. We gladly offer you our engineering service. Write for details.

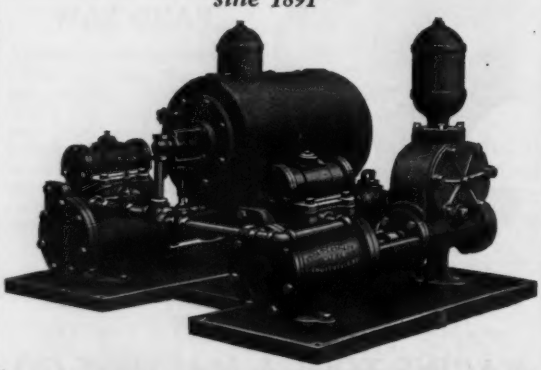
Morehead Manufacturing Company
Dept. C, Grand River at Warren,
DETROIT, MICHIGAN

(124)

Morehead
"BACK-TO-BOILER-SYSTEM"
POSITIVELY DRAINS ALL TYPES OF STEAM APPARATUS. DELIVERS CONDENSATION AND FEED WATER TO BOILERS UNDER ALL CONDITIONS AT MAXIMUM TEMPERATURE

REILLY PUMPS

Double Automatic Feed Pump & Receiver
"Good Pumps since 1891"



VAGT BRATHERS MFG. CO.
(NATIONAL FOUNDRY & MACHINE CO.)
INCORPORATED
LOUISVILLE. KENTUCKY.

LUNKENHEIMER BRONZE REGRINDING VALVES

FIG. 407

Their supremacy has been positively established by the service rendered

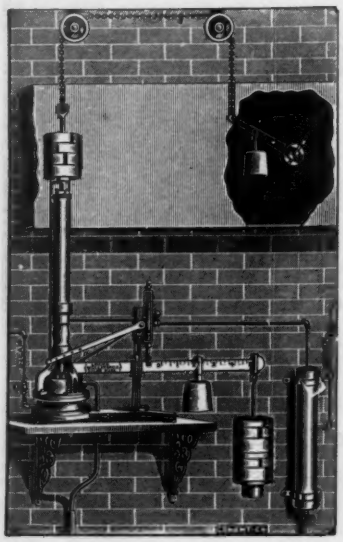
THE LUNKENHEIMER CO.
"QUALITY"
LARGEST MANUFACTURERS OF HIGH GRADE ENGINEERS' SPECIALTIES IN THE WORLD
NEW YORK BOSTON CHICAGO CINCINNATI, U.S.A. LONDON
EXPORT DEPT. 123-125 LAFAYETTE ST., NEW YORK

3-23-9

"America's Best since 1862"

1921 MODEL **LOCKE** TRADE MARK With Improved Pilot Valve

DAMPER REGULATORS



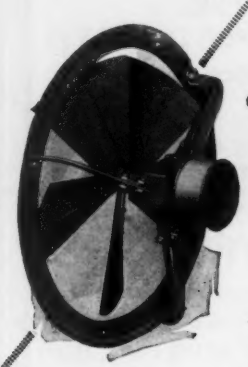
THE LOCKE Hydraulic Automatic Damper Regulator was invented by Mr. N. C. Locke at a time when the regulation of dampers was chiefly by hand and, at best, at a variation of 10 to 15 lbs. steam pressure. The LOCKE Regulator makes it possible to automatically regulate from one to twenty dampers, from the smallest to the heaviest, at a variation of steam pressure of one lb. or less. A LOCKE Regulator is as essential as coal in the up-to-date power plant. There are $3,000,000 of "LOCKE'S" in active use today, whose purchase was based on the fact that official Government tests prove that a "LOCKE" means 10% to 14% saving in coal consumption.

Also manufacturers of

Back Pressure Valves
Reliance Valves
Slasher Regulators
Relief Valves
Non-Return Valves
Paper Drying Regulators
Pump Governors
Reducing Valves
Steam Separators
Steam Traps
Water Regulators
Engine Stop and Speed Limit Systems

LOCKE REGULATOR CO., Salem, Mass.

J. C. Lyden, 907 S. Tryon St., Charlotte, N. C.
Southern Representative: N. Y. Representative: Rowland & Burns, 39 Cortlandt St., New York City. No other agency or representative in New York City.



"Buffalo" Pulley Disc Fans (Simplex)

each have two large, ring-oiling, bronze bushed bearings — both on the inside of the fan—no reaching through the wheel to oil the outer bearing.

Blades are of pressed steel and perfectly balanced.

Send for Catalog No. 860-97 concerning all sizes

BUFFALO FORGE COMPANY
188 Mortimer St. Buffalo, N. Y.

Made for maximum service not merely the average

TRADE JENKINS MARK

Jenkins Bros

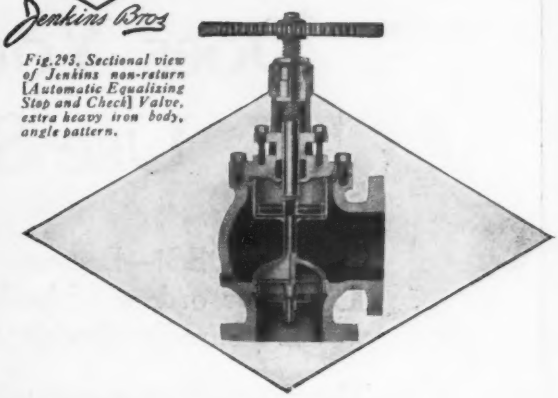


Fig. 293, Sectional view of Jenkins non-return [Automatic Equalizing Stop and Check] Valve, extra heavy iron body, angle pattern.

Cutting in boilers with safety

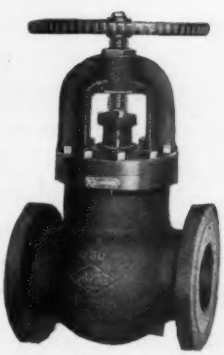


Fig. 291, Jenkins Automatic Stop and Check Valve, globe, flanged, suitable for 250 lbs. working steam pressure.

Fig. 297, Jenkins Cast Steel Non-Return Valve, extra heavy angle pattern, good for 350 lbs. working steam pressure.

In plants where two or more boilers are set in battery and all connected to the same main steam header—if just an ordinary stop valve is installed between each boiler and the main header, cutting-in a boiler after it has been out of service for a time is a dangerous operation.

It must be performed by the attendant slowly and with great care. For unless the pressure in the boiler be brought up to the precise pressure in the steam main, the two must not be put into communication.

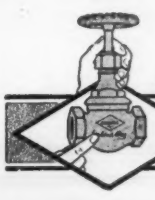
For this reason the importance of the Jenkins Non-Return (automatic stop-check) Valve cannot be overemphasized. All that is necessary for the attendant to do is to open wide the stop valve. The Jenkins Non-Return Valve remains closed until the two pressures are equal and then opens automatically.

Cutting-in the boiler is done without the service of the attendant, and with perfect safety.

Full information on request. Write our nearest office.

JENKINS BROS.

80 White Street .....New York, N. Y.
524 Atlantic Avenue.....Boston, Mass.
133 No. Seventh Street, Philadelphia, Pa.
646 Washington Boulevard, Chicago, Ill.



Always marked with the "Diamond"

Jenkins Valves

SINCE 1864

Does Your Grocer Use Scales?

HE DOES!—Because you expect him to weigh your orders of bulk goods. If he didn't you would assuredly change your trading place.

The same thing is true with circulation. During the last few years Advertisers have not been satisfied to *suppose* they were getting a certain circulation for their money; they don't want to be merely *told*, they want to *know*.

They want the circulation measured by a standardized and unquestionable measurement.

The Audit Bureau of Circulations is the recognized authority for proving circulation. It is maintained as a co-operative organization by the advertisers, advertising agencies and publishers who realize the necessity for businesslike methods in advertising.

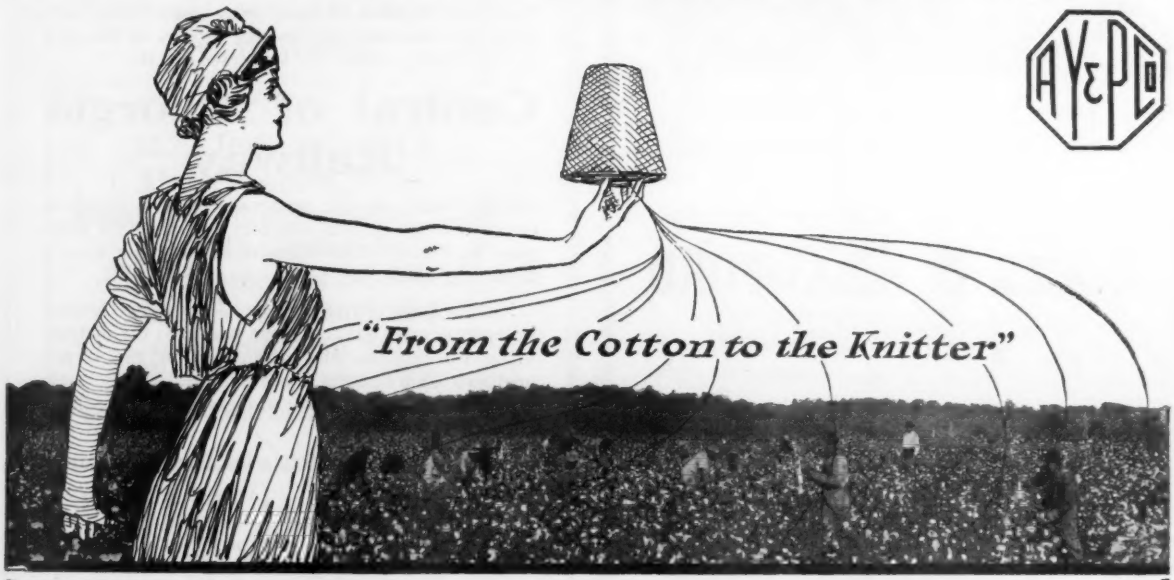
A. B. C. reports place in the hands of advertisers essential facts that have been secured and verified by a searching examination of the publisher's records.

You don't need to buy Space by Guess!

You can get the full circulation facts on COTTON by referring to the last A. B. C. report which will be gladly furnished on request.

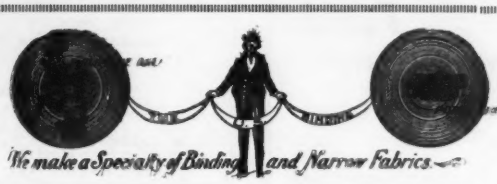
(WRITE TO THE AUDIT BUREAU OF CIRCULATIONS, 202 SOUTH STATE STREET, CHICAGO, FOR A COPY OF "THE MEASURE OF YOUR MESSAGE")

Commission Merchants, Yarn Dealers, Cotton Dealers and Brokers, Banks, Etc.



AMERICAN YARN & PROCESSING CO.
MOUNT HOLLY, N. C.
SPINNERS AND MERCERIZERS
HIGH GRADE COMBED AND CARDED YARNS—16s to 80s
Our Mercerized Yarns Are the Product of Our Own Mills
General Office, Mt. Holly, N. C.
Representatives
H. B. ROBIE, 346 Broadway, New York City
FORREST BROS., Forrest Bldg., Philadelphia

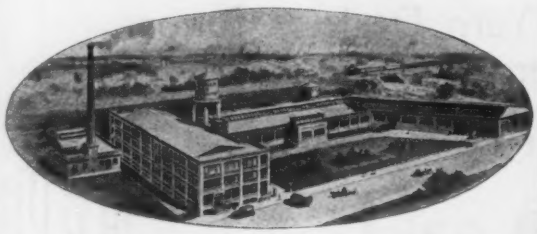
Weimar Bros.
Phone Connections
Works, 2046-48 Amber Street,
PHILADELPHIA, PA.



MANUFACTURERS OF
Cotton Mercerized Tapes, Spool Tapes, Bindings and Narrow Fabrics for Underwear and other Trades.

WOODWARD, BALDWIN & CO.
DRY GOODS
Commission Merchants
43-45 WORTH STREET, NEW YORK

HUGHES FAWCETT
IMPORTER AND COMMISSION MERCHANT
LINEN YARNS
For Weaving, Knitting and all Purposes.
TURKEY RED YARNS
For Towel Borders, Towellings and Bleaching Cloth
Linen Jacquard Harness Twine
And Every Description of Linen Thread and Twine
115 Franklin Street, : NEW YORK



View of our Mercerizing and Bleaching Plant

BOGER & CRAWFORD

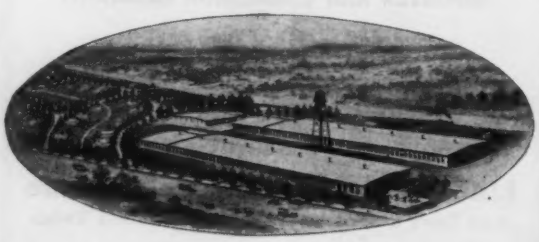
Established 1908

Spinners, Bleachers, Dyers and Mercerizers of High Grade Combed Yarns

By using our Spinning and Mercerizing you are always assured of a standard product.

"From the Cotton Field Direct to You"

Main Office, Factory and Warehouse
J and East Venango Sts., PHILADELPHIA



Spinning Mills, Lincolnton, N. C.

To the
MANUFACTURER and DISTRIBUTOR

Abundant supplies of coal, coke, iron, timber and other raw materials lie in the regions of Georgia and Alabama, which are traversed by the

Central of Georgia Railway

Cheap electric power, numerous undeveloped water powers, good home markets and excellent shipping facilities. Therefore, manufacturing conditions are ideal.

Many of the cities on the Central of Georgia Railway occupy advantageous positions for distributing warehouses, and a number of the larger northern and eastern manufacturers supply their southeastern trade from branch houses in these cities.

Full and detailed information upon application.

J. M. MALLORY,
General Industrial Agent
233 WEST BROAD STREET, SAVANNAH, GEORGIA

F. W. LAFRENTZ & CO.
PUBLIC ACCOUNTANTS
100 Broadway, New York City

BRANCHES

New York	Baltimore	Los Angeles
Richmond	Milwaukee	Atlanta
Washington, D. C.	Boston	Philadelphia
Chicago	New Orleans	Scranton
Wilkes Barre	London, England	

Our reports of audit and our certificates on condition and operations are known and have weight in the financial centers of the world.

Atlanta Branch:
1013 FOURTH NATIONAL BANK BUILDING,
ATLANTA, GEORGIA
F. W. LAFRENTZ, C.P.A., (N.Y.) A. F. LAFRENTZ, C.P.A., (N. Y.)
C. B. BIDWELL, C.P.A. (GA.), Resident Partner

CARVER-BEAVER YARN CO.
Successors to A. D. SALKELD & BRO., Inc.
ALL NUMBERS COTTON MERINO **YARNS** ALL COLORS WOOL WORSTED
366 BROADWAY, NEW YORK

STENCILS FOR COTTON SHIPPERS, COTTON MILLS MERCHANTS & MANUFACTURERS - ALSO BRUSHES, INK, MARKING POTS
RUBBER STAMPS, NOTARIAL - CORPORATION SEALS
ATLANTA RUBBER STAMP & STENCIL WORKS
OFFICE 53 LUCAIE ST. WORKS 1550 EDGEWOOD AVE.
P.O. BOX 854. OLDEST STENCIL AND STAMP HOUSE IN GEORGIA ATLANTA GA

Callaway Mills

INCORPORATED

345 Madison Avenue

Phone—Murray Hill 7801

NEW YORK

SELLING AGENTS
Unity Cotton Mills
Milstead Manufacturing Co.
Elm City Cotton Mills
Manchester Cotton Mills
Hillside Cotton Mills
Unity Spinning Mills
Villa Rica Cotton Mills
Athens Manufacturing Co.

Boston Representative
M. R. ABBOTT,
110 Summer Street

Chicago Representative
RAY T. JOHNSON
226 W. Adams Street

Akron Representative
LAWRENCE A. WATTS, Second National Building

J. B. JAMIESON CO.

77 SUMMER ST.

BOSTON MASS.

Commission Merchants

COTTON YARNS

of all descriptions for weaving and knitting.

We solicit accounts.

Wire or write us any offerings.

Time Proven Quality, In Cotton Yarns

For a quarter of a century we have been spinning good cotton yarns whose strength, uniformity, cleanliness and better weaving qualities can be vouched for by some of the country's best known manufacturers of textile products.

26 to 40s Carded — *Skeins, Warps*
50 to 60s Combed — *Cones, Tubes*

Lenoir Cotton Mills
Hudson Cotton Mfg. Co
Whitnel Cotton Mill Co.
Moore Cotton Mill Co.
Nelson Cotton Mill Co.

Address inquiries to the main office

LENOIR, NORTH CAROLINA

J. L. NELSON, *Treasurer*
J. L. NELSON, JR., *Assistant Treasurer*

ESTABLISHED 1872

H. & B. BEER

NEW ORLEANS

HENRY BEER
J. WILLIAM BARKDULL
EDGAR H. BRIGHT
C. MORGAN ABRAMS

MEMBERS OF

New Orleans Cotton Exchange
New Orleans Future Brokers Association
New York Stock Exchange
New York Cotton Exchange
New York Coffee Exchange
New York Produce Exchange
Chicago Board of Trade

Associate Members of the Liverpool Cotton Association

Private Wires to Principal Points

CLASSIFIED ADVERTISING

RATES

DISPLAYED.

"For Sale" and all other advertisements using bold face type or otherwise displayed, $2.00 per inch per insertion.

Rates for larger spaces furnished on application.

WITHOUT DISPLAY.

"Positions Wanted" 3 cents per word per insertion. Minimum charge 50 cents. Payable in advance.

"Positions Open" and other undisplayed advertisements, 4 cents per word per insertion. Minimum charge $1.00. Payable in advance.

(*When replies are to be received in our care, allow four words for box address.*)

FOR SALE

5—Whitin Quilling Machines, long chain, 378 spindles, 1920 Model F, including friction drums, reed turntables, oil guards, lease rods and holders.

5—General Electric—3 H.P. motors A.C.—2 phase 60 cycle.

4—Foster Speed Coners, Model 30—Chain drive—100 spindles.

4—General Electric—5 H.P. motors A.C.—2 phase 60 cycles.

All the above are practically new.

Frank F. Pels Co.
New Durham, North Bergen, N. J.

Position Wanted

by Production Engineer or Superintendent

General engineering education. Experience—one and one-half years with the U. S. Tariff Commission as cotton cloth expert and eight years' general mill experience in yarn and cloth mills. Has held positions as production engineer and assistant general manager. Thirty-two years of age. Address Box 102, care of COTTON, Grant Bldg., Atlanta, Ga.

Position Wanted

Superintendent with several years' experience on Tire Fabrics, desires to connect with Southern mill. Has been in one place for past eleven years and is familiar with requirements of all leading tire makers. Address Box 103, care of COTTON, Grant Bldg., Atlanta, Ga.

WANTED

Experienced Paint Representative

A large well-known paint manufacturer desires a representative to handle their sales among the Southern textile mills. Must be a man with experience in selling paint to the textile mills, and one with ability to manage business in the Southern territory. Remuneration will be more than satisfactory. State full qualifications in first letter.

Address Box W. J. R., c/o COTTON, 1020 Grant Building, Atlanta, Ga.

New and Second Hand

ENGINES

Corliss Automatic and Slide Valve

BOILERS

Pumps, Hoisting Engines, Gas and Gasoline Engines.

MACHINE TOOLS

Lathes, Planers, Shapers, Drill Presses, etc.

WOOD WORKING

Planers, Molders, Band Saws, etc.

ELEC. MACHINERY

Dynamos and Motors

AND SUPPLIES OF ALL KINDS

FRANK TOOMEY, Inc.,
127-31 N. Third St.,
Philadelphia, - Pennsylvania

I Want A Position In a Southern Mill

Have been in the mill for eighteen years, and have been overseer of carding for eight years.

At present I am overseer in a fine combed yarn mill making yarns of very good quality.

I am in New England, however, and the conditions do not suit me.

Am an American, 35 years of age, and will furnish satisfactory references.

Will take the place of overseer in a large mill, or would like superintendency of a small plant, more preferably a combed yarn proposition.

If you need a man of this kind, address

Box 109,
Care COTTON,
Grant Bldg., Atlanta, Ga.

DO YOU NEED

A SUPERINTENDENT, PRODUCTION MANAGER or FOREMAN?

I am a middle-aged, experienced mill man with a desire to locate in the South.

Can furnish good references; am settled, reliable and sober. Willing to push a job to the limit to satisfy.

Address:

Box 108,
Care COTTON,
Grant Bldg., Atlanta, Ga.

WANTED

EXPERT OVERSEER FINISHING

High-Class Man as Finisher on chambrays and cheviots. To take charge of processes covered by the starch mangle, tenter and calender. Southern Mill. Apply to

Box 110,
Care COTTON,
Grant Bldg. Atlanta, Ga.

Are You Looking For Equipment?

We offer slightly used equipment from the Old Hickory Powder Plant at attractive prices.

COTTON DRYERS. Sargent No. 24 six-section 8-foot Cotton Dryers. Overall dimensions 99'4" long, 15' 5" wide, 7'10" high. Equipped with Model "M" self-feeders. Constructed throughout of metal angles and plates, and equipped with automatic sprinkler systems.

MIXING PICKERS. Sargent Cylindrical Type, 48-in. Mixing Pickers, equipped with single pair fluted feed rolls, 3½ in. diameter. Cylinder provided with six heavy steel bars on lugs bolted to spider. Capacity 600 to 800 lbs. per hour.

CORLISS ENGINES. Maker, Allis-Chalmers Co. 350 h.p., 18" x 36" double eccentric, semi-high speed, 125 r.p.m., simple Corliss belted type. Designed to operate on 140 lbs. steam pressure, with 1½ lbs. back pressure. Double eccentric allows cut-off up to 75 per cent of stroke. Fly-wheel 11 ft. diameter by 32 in. face. Complete with Phoenix individual oiling systems, type R, size 30, made by Richardson-Phoenix Co.

FEEDERS. Sargent 48-in. Model "M" Feeders for Sargent Dryers.

WRINGERS. 42-in. American Tool and Machine Company Centrifugal Wringers. Complete with 42-in. perforated steel basket shell, with steel top, basket 22½-in. inside depth, ⅜-in. steel. Wringers direct connected to 40 h.p. motors.

36-in. American Tool and Machine Company Belt Driven Centrifugal Wringers. Each set arranged in batteries of three.

COTTON WASHERS. Sargent 48-in. Special Cotton Washers or Rinsers. Complete with cast iron frame, pens, squeeze rolls, kicker and conveyor.

BOILERS. 823 h.p. Class M-30, Babcock & Wilcox Stirling Water Tube Boilers. 200 lbs. pressure. Drums double riveted, double strap butt joint. Space occupied by boiler, 18'x23'x29'9". Complete with Westinghouse stokers, forced draft fans, Vulcan soot blowers, and all accessories.

CONCENTRATORS. Noble and Wood Concentrators, right and left hand cylinder washers with octagon cylinder. Diameter 44 in., length 42 in. Rotates at 6 r.p.m. Vat is 4 ft. 1½ in. wide, 6 ft. 9 in. long, 2 ft. 9 in. high.

Motors	**Transmission**	**Steam Pumps**
Transformers	**Digesters**	**Centrifugal Pumps**
Jordan Engines	**Scales**	**Diaphragm Pumps**
Agitators	**Valves**	**Industrial Cars**
Mixers	**Pipe Fittings**	**Chemicalware**
Blowers	**Tanks**	**Acid Plants**

Let us know what you need.

OLD HICKORY POWDER PLANT

Old Hickory, Tennessee

The Old Hickory Powder Plant was in actual productive operation less than three months.

Buyers' Index

ACETYLENE GENERATING APPARATUS.
Oxweld Acetylene Co.

ACETYLENE WELDING APPARATUS.
(See Welding Apparatus.)

ACIDS.
(See Dyestuffs and Chemicals.)

ACCOUNTANTS.
Ernst & Ernst.
La Frents & Co., F. W.

ACCOUNTING SYSTEMS.
Ernst & Ernst.

AERATING AND CLEANING MACHINE.
Murray Co., The.

AIR WASHERS.
American Blower Co.
Carrier Eng. Corp.
Parks-Cramer Co.

AIR COMPRESSORS.
(See Compressors.)

AIR CONDITIONING SYSTEMS
(See Humidifying Apparatus.)

ALBONE.
Roesler & Hasslacher Chemical Co.

ALKALIES.
(See Dyestuffs and Chemicals.)

ALUM.
(See Finishing and Sizing Materials.)

ANILINE COLORS.
(See Dyestuffs and Chemicals.)

ANTI-CHLORINE.
(See Dyestuffs and Chemicals.)

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Bond Co., Chas.

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Dallis, Park A.
Lockwood, Greene & Co.
McCrary Co., J. B.
Robert & Co.
Sirrine, J. E.

ARMATURE REWINDING.
(See Repairing—Electrical.)

ARTWORK.
Jacobs & Co.

ASH HANDLING MACHINERY.
(See Coal and Ash Handing Machinery.)

ASPHALT SLATE SHINGLES.
(See Slate Asphalt Roofing.)

AUDITORS AND ACCOUNTANTS.
Ernst & Ernst.
La Frents & Co., F. W.

AUTO TRUCKS.
(See Trucks—Auto.)

AUTOMATIC CONTROLLERS (TEMPERATURE).
(See Temperature Regulators.)

AUTOMATIC LOOM ATTACHMENTS.
(See Loom Attachments.)

AUTOMATIC FEEDS FOR COTTON.
Phila. Drying Mchy. Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Sargent's Sons Corp., C. G.
Whitin Mch. Works.

AUTOMATIC SCALES.
(See Scales.)

AUTOMOBILES.
White Co.

AWNINGS.
Smith Mfg. Co.

BABBITT METAL.
Ryerson & Son, Inc., Jos. T.

BACKWASHERS.
Sargent's Sons Corp., C. G.

BAGS (COTTON PICKER).
Smith Mfg. Co.

BAGS (COIN OR MONEY).
Smith Mfg. Co.

BAGS (COAL).
(Smith Mfg. Co.

BALL BEARINGS.
Aldrich Mch. Works.
Dodge Mfg. Co.
Fulton Supply Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Skayef Ball Bearing Co.
U. S. Ball Bearing Co.

BALL BEARING HOUSINGS.
Aldrich Machine Works.
Fafnir Bearing Co.
Fulton Supply Co.
U. S. Ball Bearing Co.

BALE BAND BUCKLES.
(See Box Strappings & Buckles.)

BALE OPENERS.
(See Openers.)

BALING MACHINES.
Crompton & Knowles Loom Wks.
Draper Corporation.
Economy Baler Co.
Logemann Bros.
Saco-Lowell Shops.

BALING PRESSES.
(See Presses.)

BANDAGES, TAPES, ETC.
American Textile Banding Co.
Weimar Bros.

BANDAGE & TAPE MACHINES
Foster Machine Co.
Whitin Mch. Wks.

BANDS.
(See Tapes.)

BANKS.
American Trust Co.

BARS (IRON AND STEEL).
Ryerson & Son, Inc., Jos. T.

BAROMETERS.
Taylor Instrument Co.

BARRELS—FIBRE.
(See Fibre Products.)

BASKETS—MILL.
(See Boxes—Mill.)

BATH CABINET—SHOWER.
Durable Steel Locker Co.
Manufacturers Equip. & Eng. Co.
Sanymetal Products Co.

BATTERIES (ELEC.)
(See Storage Batteries.)

BEAMS.
Allen Co.
Mosaberg Pressed Steel Corp.
U S Bobbin & Shuttle Co.

BEAM HEADS.
Allen Co.
Jordan Mfg. Co.
Mossberg Pressed Steel Corp.
U S Bobbin & Shuttle Co.

BEAMS (STEEL).
Ryerson & Son, Inc., Jos. T.

BEAMING AND WARPING MACHINERY.
(See Warpers and Warping Machinery.)

BEARINGS.
Aldrich Machine Works.
Cresson-Morris Co.
Dodge Mfg. Co.
Fulton Supply Co.
Fafnir Bearing Co.
Hyatt Roller Bearing Co.
Moccasin Bushing Co.
Ryerson & Son, Inc., Jos. T.
Skayef Ball Bearing Co.
U. S. Ball Bearing Co.

BELTING (LEATHER, CANVAS AND RUBBER).
American Supply Co.
Bond Co., Chas.
Fulton Supply Co.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELTING—CHAIN.
Diamond Chain & Mfg. Co.
Dodge Mfg. Co.
Fulton Supply Co.
Link-Belt Company.
Morse Chain Co.

BELTING (ROUND—LEATHER).
Bond Co., Chas.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.

BELTING—ROPE.
(See Rope Transmission.)

BELT CONVEYORS.
Dodge Mfg. Co.
Fulton Supply Co.
Link Belt Company.
Morse Chain Co.

BELT DRESSING.
Bond Co., Chas.
Dixon Crucible Co., Jos.
Fulton Bag & Cotton Mills.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELT FASTENERS.
Detroit Belt Lacer Co.
Flexible Steel Lacing Co.
Fulton Supply Co.

BELT LACING (LEATHER).
Bond Co., Chas.
Dodge Mfg. Co.
Fulton Supply Co.
Graton & Knight Mfg. Co.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

BELT TIGHTENERS.
Dodge Mfg. Co.
Fulton Supply Co.
Link-Belt Company.
Rhoads & Sons, J. E.

BELT TIGHTENER DEVICE FOR CONE PICKERS.
Bahan Textile Mch. Co.

BENCHES MECHANICS' CLOTH ETC.
Allen Co.

BENCHES (PARK AND PLAYGROUND).
(See Playground Equipment.)

BINS (METAL).
Mills Co.

BLEACHERIES.
(See Dyers, Bleachers and Finishers.)

BLEACHING KIERS.
Butterworth & Sons Co., H. W.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Machry. Co.
Woolford Wood Tank Co., G.

BLEACHING MACHINERY.
(See Dyeing, Bleaching and Finishing Machinery.)

BLEACHING, FINISHING AND SIZING MATERIALS.
(See Finishing Materials.)

BLOWERS AND BLOWER SYSTEMS.
American Blower Co.
Buffalo Forge Co.
Carrier Eng. Corp.
General Electric Co.
Philadelphia Drying Mchry. Co.
Westinghouse Elec. & Mfg. Co.

BLOWPIPES (BRAZING, CUTTING, WELDING).
Oxweld Acetylene Co.

BOARDS (FILLING).
Davis Mfg. Co., Frank.

BOBBINS.
Brown Co., David.
Draper Corporation.
Fulton Supply Co.
Jordan Mfg. Co.
Lestershire Spool & Mfg. Co.
Parker Co., Walter L.
Shambow Shuttle Co.
U S Bobbin & Shuttle Co.
Whitin Machine Works.

BOBBIN HEADS.
Brown Co., David.
Jordan Mfg. Co.
U. S. Bobbin & Shuttle Co.

BOBBIN STRIPPERS.
Crompton & Knowles Loom Works.
Terrell Machine Co.

BOILERS.
International Engineering Wks., Inc.
Lombard Iron Works & Supply Co.
Old Hickory Powder Plant.
Toomey, Frank.
Walsh & Weidner Boiler Co.

BOILER COMPOUNDS.
Dixon Crucible Co., Jos.

BOILER FEED WATER PURIFICATION.
Hungerford & Terry, Inc.

BOILER ROOM FITTINGS AND SUPPLIES.
American Blower Co.
Crane Co.
Dixon Crucible Co., Jos.
Fulton Supply Co.
International Engineering Co.
Jenkins Bros.
Old Hickory Powder Plant.

BOILER GRATES AND STOKERS.
(See Grates and Stokers.)

BOILER TUBES AND FITTINGS.
Ryerson & Son, Inc., Jos. T.

BOLTS AND NUTS.
Ryerson & Son, Inc., Jos. T.

BONDS AND STOCKS (TEXTILE MILL).
American Trust Co.

BOX STRAPPING AND TIE BUCKLES.
(See Banding Straps and Buckles.)

BOXES—MILL.
Allen Co.
Morris & Co., Inc.
Smith Mfg. Co.
Standard Fibre Co.

BOXES—PACKING.
(See Packing Boxes.)

BRAID.
(See Tapes.)

BRAZING.
(See Welding.)

BRICK (BUILDING & PAVING).
National Paving Brick Mfg. Asso.

BROKERS—COTTON.
(See Cotton Dealers & Brokers.)

BROKERS—STOCK.
(See Stocks and Bonds.)

BROOMS.
(See Brushes.)

BRUSHES—MILL.
Atlanta Brush Co.
Mason Brush Wks.

BRUSHES—MOTOR AND GENERATOR (COMMUTATOR).
Dixon Crucible Co., Jos.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

BUCKETS AND PAILS—MILL.
Morris & Co., Inc.
Smith Mfg. Co.

BUCKETS—ELEVATOR AND GRAB.
Link-Belt Company.

BUCKLES—COTTON TIE.
(See Box Strapping and Ties.)

BUILDING CONTRACTORS.
(See Contractors.)

BUILDINGS (PORTABLE STEEL).
Dowman, George.
Dowman-Doxier Mfg. Co.

BUILDINGS (READY BUILT).
Minter Homes Co.

BUILDINGS (ALL STEEL).
Dowman, George.
Truscon Steel Co.
Maryland Metal Building Co.

BUILDING MATERIAL.
Birmingham Slag Co.
Bogart & Carlough Co.
Callahan Co., T. J.
Detroit Graphite Co.
DeVilbiss Mfg. Co.
Dixie Portland Cement Co.
Dowman-Doxier Mfg. Co.
Dowman, George.
Dufur & Co.
Kirkpatrick Lumber & Timber Co.
Maryland Metal Building Co.
Minter Homes Co.
Murphy's Sons, C. P.
National Paving Brick Mfg. Asso.
Richardson Co.
St. Louis Surfacer & Paint Co.
Sanymetal Products Co.
Sonneborn Sons, Inc., L.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.
Truscon Steel Co.
Variety Fire Door Co.
Wagner Mfg. Co.
Ware Paint Co.

BURR PICKERS.
Proctor & Schwartz, Inc.
Sargent's Sons, C. G.

BUSHINGS.
Moccasin Bushing Co.
Southern Spindle & Flyer Co.

BUSINESS METHODS.
(See Consultants.)

CABINETS.
(See Lockers.)

CALENDERS.
Butterworth & Sons Co., H. W.
Textile Finishing Mchry. Co.

CALENDER ROLLS.
(See Rolls—Calender.)

CALLING SYSTEM—INTER-TELEPHONE.
Carter Electric Co.

CAMPING EQUIPMENT, FURNITURE, STOVES, LIGHTS, ETC.
Smith Mfg. Co.

CANS (DRYING).
(See Drying Equipment.)

CARS AND TRUCKS—FIBRE.
(See Trucks.)

CARDS (BUSINESS OR CALLING—ENGRAVED).
Wiggins Co., John B.

CARBON BURNING APPARATUS.
Oxweld Acetylene Co.

CARBON RODS AND PASTE (WELDING).
Oxweld Acetylene Co.

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Klauder-Weldon Dyeing Machine Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Sargent's Sons & Co., C. G.
Textile Finishing Mchry. Co.
Tolhurst Mch. Works.

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Proctor & Schwartz, Inc.
Roy & Son, B. S.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

CARD & NAPPER CLOTHING.
Howard Bros. Mfg. Co.

CARD FEEDS.
Proctor & Schwartz, Inc.
Schofield Co., Wm.
Whitin Machine Co.

CARD GRINDING MACHINERY.
Proctor & Schwartz, Inc.
Roy & Son, B. S.
Whitin Machine Works.

CARPET MACHINERY.
Butterworth & Sons Co., H. W.
Crompton & Knowles Loom Works.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Schofield, Wm., Co.
Textile Finishing Mchry. Co.

CARRIER APRONS.
(See Aprons.)

CARRIER SYSTEM.
Curtis Pneumatic Machry. Co.
Louden Machinery Co.
Wagner Mfg. Co.

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(See Packing Cases.)

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Rome Machine & Fdry. Co.
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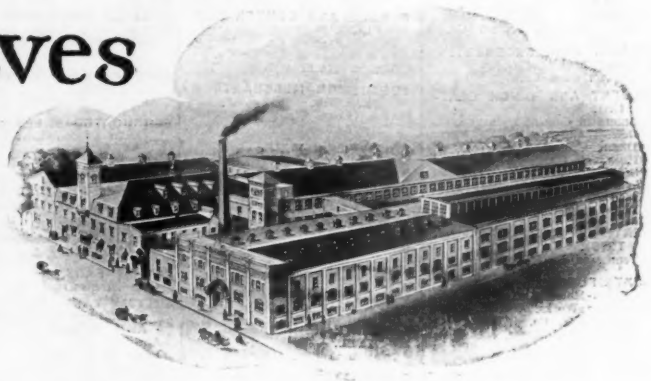

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Truscon Steel Co.

CEMENT AND BRICK COATING.
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Detroit Graphite Co.
Dixon Crucible Co., Jos.
Hockaday Co.
Sonneborn Sons, Inc., L.
Wadsworth, Howland & Co., Inc.
Ware Paint Co.

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Tennessee Electric Power Co.

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Cresson-Morris Co.
Fletcher Works.
Goulds Mfg. Co.
Schaum & Uhlinger.
Tolhurst Mch. Wks.

CHAIN DRIVES.
(See Belting—Chain Link.)

CHAIN—BLOCK, BICYCLE, AUTO, ENGINE, AGRICULTURAL, ETC.
Diamond Chain & Mfg. Co.
Fulton Supply Co.
Link Belt Co.
Morse Chain Co.

CHAIRS AND STOOLS.
(See Furniture—Mill.)

CHECK STRAPS.
Bond Co., Chas.
Fulton Supply Co.
Jacobs Mfg. Co., E. H.

CHEMICALS.
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CHLORINE GAS.
Electro Bleaching Gas Co.
Mathieson Alkali Works, Inc.

CLEANING MACHINERY (CLOTH AND YARN).
Rome Mch. & Fdry. Co.

CLEANING AND AERATING MACHINE FOR COTTON.
Murray Company, The.

CLEARER CLOTH.
(See Cloth.)

CLOCKS—HANK, ETC.
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CLOCKS (TIME).
Root Co.

CLOCKS—WATCHMAN.
Foxboro Co., Inc.
Root Co.

CLOSETS—WATER.
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CLOTH (ROLLER, CLEARER AND SLASHER).
Best & Co., Edw. H.
Phila. Felt Co.

CLOTH CUTTERS.
Firsching, J. A.
Foster Machine Co.
Wildman Mfg. Co.

CLOTH ROOM MACHINERY.
Butterworth & Sons Co., H. W.
Firsching, J. A.
Foster Machine Co.
Hopedale Mfg. Co.
Saco-Lowell Shops.
Textile Finishing Mchry. Co.
Williams Co., J. H.
Wildman Mfg. Co.

CLOTH SHRINKING MACHINERY.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Tolhurst Mch. Wks.

CLOTH TESTERS.
Scott Co., Henry L.

CLOTH WINDERS.
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CLUTCHES—FRICTION.
Allis-Chalmers Mfg. Co.
Carlyle-Johnson Machine Co.
Cresson-Morris Co.
Fulton Supply Co.
Link-Belt Company.

CLUTCH LININGS.
Carlyle-Johnson Mch. Co.

COAL AND COKE.
General Coal Co.

COAL AND ASH HANDLING MACHINERY.
Link-Belt Company.
Louden Machinery Co.

COAL TAR DISINFECTANTS.
(See Disinfectants.)

COCKS.
(See Valves.)

COLOR PAILS.
(See Buckets—Mill.)

COMB APRONS.
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COMBER AND COMBER SUPPLIES.
Foster Machine Co.
U S Bobbin & Shuttle Co.
Whitin Machine Wks.

COMMISSION MERCHANTS & DEALERS.
(See Cotton Cloth Commission Merchants.)

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Curtis Pneumatic Mchry. Co.
Fulton Supply Co.
General Electric Co.
Goulds Mfg. Co.

COMMUTATOR BRUSHES.
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Birmingham Slag Co.

CONCRETE REINFORCING STEEL.
Ryerson & Son, Inc., Jos. T.

CONDENSERS.
Allis-Chalmers Mfg. Co.

CONDUITS.
(See Elec. Machinery & Supplies.)

CONE BELT TENSION DEVICE.
Bahan Textile Mch. Co.

CONES (KNITTING YARN).
Foster Mch. Co.
Sonoco Products Co.

CONE WINDING MACHINE.
(See Winding Machinery.)

CONNECTORS—FRANKEL SOLDERLESS.
Westinghouse Elec. & Mfg. Co.

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Ernst & Ernst.

CONSULTING ENGINEERS.
(See Architects and Engineers)

CONTRACTORS AND ENGINEERS—BUILDING.
Dowman, George.
Dowman-Dozier Mfg. Co.
Sirrine & Co., J. E.
Truscon Steel Co.

CONTRACTORS—ELECTRICAL.
(See Electrical Engineers.)

CONTRACTORS (PAINTING).
Williams, C. L.

CONTRACTORS (ROOFING).
Dowman, Geo.
Dowman Dozier Mfg. Co.
Murphy's Sons, C. P.

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McCrary Co., J. B.

CONTRACTORS (WATERWORKS).
McCrary Co., J. B.

CONTRACTORS (SEWAGE).
McCrary Co., J. B.

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(See Belt Conveyors.)

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American Supply Co.
Chisholm-Moore Mfg. Co.
Cresson-Morris Co.
Curtis Pneumatic Mchry. Co.
Dowman, George.
Fulton Supply Co.
Link-Belt Co.
Louden Machinery Co.
Mathews Gravity Carrier Co.
Morse Chain Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Schofield, Wm. Co.
Wagner Mfg. Co.

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Link-Belt Co.
Mathews Gravity Carrier Co.

CONVEYORS (ROLLER).
Mathews Gravity Carrier Co.

COOLERS.
(See Humidifying Apparatus.)

COOLERS—WATER.
(See Water Coolers.)

COOLING AND CONDITIONING EQUIPMENT.
American Blower Co.
Buffalo Forge Co.

COOLING TOWERS.
(See Tanks and Towers.)

COPPER STAMPS AND STENCILS.
(See Stamps, Stencils, etc.)

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Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

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American Trust Co.

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Ernst & Ernst.

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Minter Homes Co.

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Murray Company, The.

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Boger & Crawford.
Callaway Mills.
Carver-Beaver Yarn Co., Inc.
Fawcett, Hughes.
Florsheim, H. A.
Hunter Mfg. & Comm. Co.
Jamieson, J. B.
Lane & Co., J. H.
Meritzer, H. S.
Quissett Mill.
Tolar & Hart.
Weimar Bros.
Wellington, Sears & Co.
Whitman Co., Inc., Wm.
Woodward, Baldwin & Co.

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Atlanta Harness & Reed Mfg. Co.
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Bahan Textile Mch. Co.
Barber-Colman Co.
Brown Co., David.
Butterworth & Sons, H. W.
Crompton & Knowles Loom Works.
Draper Corporation.
Dowman, George.
Dryer Corp. of America.
Eclipse Textile Devices, Inc.
Firsching Co., J. A.
Fletcher Works.
Foster Machine Co.
Foxboro Co., Inc.
Fulton Supply Co.
Harris Co., Geo. W.
Hopedale Mfg. Co.
Howard Bros. Mfg. Co.
Hunt Machine Co., Rodney.
Hyatt Roller Bearing Co.
Jacobs Mfg. Co., E. H.
Lestershire Spool Mfg. Co.
Lowell Crayon Co.
Mill Devices Co.
Mossberg Pressed Steel Corp.
Parker Co., Walter L.
Phila. Drying Mchry. Co.
Proctor & Schwartz, Inc.
Reutlinger, J. J.
Root Co.
Roy & Son, B. S.
Sargent's Sons Corp., C. G.
Saco-Lowell Shops.
Schaum & Uhlinger.
Schofield Co., Wm.
Shambow Shuttle Co.
Stafford Co.
Steel Heddle Mfg. Co.
Suter, Alfred.
Terrell Machine Co.
Textile Finishing Machinery Co.
Textile Rubber Co.
Toledo Scale Co.
Tolhurst Mch. Wks.
U. S. Bobbin & Shuttle Co.
Washburn & Sons, L. R.
Williams Co., J. H.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

COTTON TAPE LOOM.
Fletcher Works.
Foster Mch. Co.
Schaum & Uhlinger.

COTTON YARN MILLS.
(See Yarn Manufacturers.)

COUNTERS—REVOLUTION, HANK, PICK, ETC.
Foxboro Co.
Root Co.

COUNTERS—RESTAURANT.
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COUPLING—SHAFT.
Cresson-Morris Co.
Dodge Mfg. Co.

COVERING—ROLLER.
Bond Co., Chas.

CRANES.
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CRAYONS.
Eclipse Crayon Co.
Lowell Crayon Co.

CREELS.
Auto Creel Corp.
Suter, Alfred.

CREOSOTED FLOORING, BLOCKS, POSTS, SHINGLES, ETC.
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Carolina Metal Culvert Co.

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CUTTERS—CLOTH.
(See Cloth Cutters.)

CUTTERS—THREAD.
(See Thread Cutters.)

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DESKS—FACTORY.
Allen Co.

DEXTRINES.
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DIAL SCALES.
(See Scales.)

DIES—STEEL.
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DIE STOCKS.
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DOBBY CHAINS.
Crompton & Knowles Loom Wks.
Whitin Machine Works.

DOBBY CARDS.
Jacobs & Co., E. H.

DOFFING BOXES—MILL.
(See Boxes—Mill.)

DOFFER FILLETS.
(See Fillets.)

DOFFING CARS.
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DOORS—STEEL.
Dowman, George.
Dowman-Dozier Mfg. Co.
Mills Co.
Variety Fire Door Co.

DRAINAGE ENGINEERS.
Carolina Metal Culvert Co.

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Jacobs & Co.

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Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

DRESSING ROOMS (METAL PARTITIONS).
Mills Co.

DRILLS—ELECTRIC.
(See Electric Machinery.)

DRINKING FOUNTAINS.
(See Fountains—Drinking.)

DROP WIRES.
Draper Corp.
Mossberg Pressed Steel Corp.
Steel Heddle Mfg. Co.
Williams Co., J. H.

DRY CLEANING MACHINERY.
Rome Machine & Fdry. Co.

DRYING APPARATUS.
American Blower Co.
Buffalo Forge Co.
Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.

DRYING FORMS—HOSIERY.
Phila. Metal Drying Form Co.

DRYING MACHINERY AND EQUIPMENT.
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American Laundry Mchry. Co.
Butterworth, H. W., & Sons Co.
Philadelphia Drying Mchry. Co.
Phila. Metal Drying Form Co.
Proctor & Schwartz, Inc.
Sargent's Sons Corp., C. G.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.

DUST COLLECTORS.
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Proctor & Schwartz, Inc.
Schofield & Sons, Wm.

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Aberfoyle Mfg. Co.
American Yarn & Processing Co.
Boger & Crawford.
Dixie Mercerizing Co.
Franklin Process Co.

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Butterworth & Sons Co., H. W.
Electro Bleaching Gas Co.
Firsching, J. A.
Fletcher Works.
Franklin Process Co.
Fulton Co.
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Hungerford & Terry, Inc.
Hunt Machine Co., Rodney.
Klauder-Weldon Dyeing Mch. Co.
Phila. Drying Machinery Co.
Proctor & Schwartz, Inc.
Reliance Machine Works.
Rome Machine & Fdry. Co.
Schaum & Uhlinger.
Textile Finishing Machinery Co., The.
Tolhurst Machine Works.
Woolford Wood Tank Co., G.

DYEING MACHINES (PACKAGE AND SPOOL).
Franklin Process Co.

DYE BAGS OR NETS.
Smith Mfg. Co.

DYE STICKS.
Phila. Drying Machinery Co.

DYE VATS AND TUBS.
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Ford Co., J. B.
Grasselli Chemical Co.
India Alkali Works.
Kali Mfg. Co.
Klipstein & Co., A.
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Mathieson Alkali Works, Inc.
Metz & Co., H. A.
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Newport Chemical Wks.
Quaker City Chemical Co.
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New Brunswick Chemical Co.
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Rohm & Haas Co.
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Stein, Hall & Co.
Surpass Chemical Co.
United Chemical Products Corp.
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(See Motors and Generators.)

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ELEVATORS.
Link-Belt Company.
Mathews Gravity Carrier Co.

ENAMELED IRON AND GLASS FOR TEXTILE MACHRY.
Mitchell-Bissell Co.

ENAMEL—MILL WHITE.
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Allis-Chalmers Mfg. Co.
Fulton Supply Co.

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Allis-Chalmers Mfg. Co.
American Blower Co.
Fulton Supply Co.
Lombard Iron Works & Supply Co.
Toomey, Frank.

ENGINE ROOM APPLIANCES AND SUPPLIES.
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Fulton Supply Co.
Jenkins Bros.
Locke Regulator Co.
Lunkenheimer Co.
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Locke Regulator Co.

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Ernst & Ernst.

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McCrary Co., J. B.

ENGINEERS (TEXTILE AND MECHANICAL CONSULTING).
Panton, Harrison D.

ENGINEERS (MECHANICAL).
Bird-Potts & Co., Inc.

ENGRAVINGS AND CUTS.
Jacobs & Co.

ETCHING—PRINTING.
Jacobs & Co.

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Schaum & Uhlinger.
Tolhurst Machine Works.

FACTORY AND INDUSTRIAL SITES.
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Ernst & Ernst.

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American Blower Co.
Buffalo Forge Co.
Carter Electric Co.
General Electric Co.
Perry-Mann Electric Co.
Southern Electric Supply Co.
Westinghouse Elec. & Mfg. Co.

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FEEDERS.
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Proctor & Schwartz, Inc.

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Cyclone Fence Co.
Dowman, George.

FENCE POSTS—CREOSOTED PINE.
Southern Wood Preserving Co.

FILLETS (CYLINDER DOFFER, BURNISHER AND STRIPPER).
Howard Bros. Mfg. Co.

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U S Bobbin & Shuttle Co.

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Bowser & Co., Inc., S. F.

FILTERS—WATER.
Hungerford & Terry, Inc.

FILTERS (ALUM).
Lennig & Co., Chas.

FILTER CLOTHS.
Smith Mfg. Co.

FINISHING.
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Newport Chemical Works.
New Brunswick Chemical Co.
Penick & Ford, Ltd.
Quaker City Chemical Co.
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Rohm & Haas Co.
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Staley Mfg. Co., A. E.
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United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

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(See Brushes.)

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Proctor & Schwartz, Inc.
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Southern Spindle & Flyer Co.
Whitin Machine Works.

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Oxweld Acetylene Co.

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Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

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Mills Co.
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Carter Electric Co.
Fulton Supply Co.
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Dowman, George.

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Taylor Instrument Co.

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Lunkenheimer Co.
Taylor Inst. Co.

GAUGES—WATER.
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(See Lubricants.)

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(See Counters.)

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Harris Co., Geo. W.

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Steel Heddle Mfg. Co.
Williams Co., J. H.

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Tayor Instrument Co.

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KETTLES—SODA.
Lombard Iron Works & Supply Co.

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Whitin Machine Works.

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Mills Co.
Sanymetal Products Co.

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Draper Corporation.
Fletcher Works.
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Schaum & Uhlinger.
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Hopedale Mfg. Co.

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N. Y. & N. J. Lubricant Co.

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Bowser & Co., S. F.
Lunkenheimer Co.
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Allen Co.

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Southern Wood Preserving Co.

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Harris Co., Geo. W.

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Locke Regulator Co.

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General Electric Co.
Locke Regulator Co.
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REGULATORS—TEMPERATURE.
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Southern Spindle & Flyer Co.

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General Machine Works.
Wildman Mfg. Co.

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Whitin Machine Works.

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(See Spinning Rings.)

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(See Bearings.)

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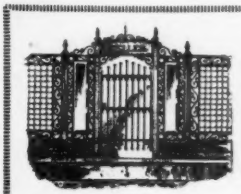

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Textile Finishing Mchy. Co.
U S Bobbin & Shuttle Co.
Washburn, Inc.

ROLLS—RUBBER COVERED.
Butterworth & Sons Co., H. W.
Textile Finishing Mchy. Co.
Stowe & Woodward Co.

ROLLS—STEEL.
Butterworth & Sons Co., H. W.
Southern Spindle & Flyer Co.
Textile Finishing Mchy. Co.
U S Bobbin & Shuttle Co.
Washburn, Inc.

ROLLS (WOODEN).
U S Bobbin & Shuttle Co.
Washburn, Inc.

ROOFING.
Cortright Metal Roofing Co.
Dowman, George.
Dowman-Dozier Mfg. Co.
Kirkpatrick Lumber & Timber Co.
Murphy's Sons, C. P.
Richardson Co.
Southern Wood Preserving Co.
Wadsworth, Howland & Co.

ROOFERS.
Dowman, Geo.
Dowman Dozier Mfg. Co.
Kirkpatrick Lumber & Timber Co.
Murphy's Sons, C. P.

ROOFS WATERPROOFED AND INSULATED.
Murphy's Sons, C. P.

ROOFING AUXILIARIES (PIPE GUTTERS—EAVE TROUGH ETC.)
Dowman, George.
Dowman-Dozier Mfg. Co.
Kirkpatrick Lumber & Timber Co.

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American Cement Paint Co.
Detroit Graphite Co.
Hockaday Co.
Johnson & Co., Inc., Oliver.
Murphy's Sons, C. P.
Sonneborn Sons, Inc., L.
Wadsworth, Howland & Co.
Ware Paint Co.

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Allis-Chalmers Mfg. Co.
Cresson-Morris Co.
Link-Belt Company.

ROVING CANS.
(See Cans—Roving.)

ROVING MACHINERY.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

RUBER COVERED ROLLS.
Stowe & Woodward Co.

RUBBER SPECIALTIES (TEXTILE MILLS).
Textile Rubber Co.
Stowe & Woodward Co.

RUBBER STAMPS.
(See Stamps, Stencils, Etc.)

SALTS.
(See Finishing & Sizing Materials.)

SASH OPERATOR (WINDOW).
Callahan Co., T. J.
Dowman, George.

SANITARY PRODUCTS.
Davis Septic Tank & Eng. Co.
Manufacturing Equip. & Eng'g Co.
Rundle-Spence Mfg. Co.
Sanymetal Products Co.
Vogel Co., Jos. A.

SANITARY ENGINEERS, CONTRACTORS & BUILDERS.
(See Engineers—Sanitary.)

SASH-WINDOW—STEEL.
(See Window Sash.)

SAWING MACHINES AND SAW BLADES.
Racine Tool & Mch. Co.

SAXOPHONES, ETC.
(See Musical Instruments.)

SCALES.
Toledo Scale Co.

SCALE PREVENTER—BOILER.
(See Boiler Feed Water Purification.)

SCREENS—MOVING PICTURE.
Southern Theatre Equip. Co.

SCREENS AND SIEVES—PERFORATED.
Allis-Chalmers Mfg. Co.
Erdle Perforating Co.
Link Belt Company.

SCOURING MACHINERY.
(See Washers—Cloth.)

SCRUBBING MACHINE—FLOOR.
American Scrubbing Equip. Co.

SCRUBBING AND WASHING POWDERS.
India Alkali Works.
Mathieson Alkali Works.
Warren Soap Mfg. Co.

SCUTCHERS.
Whitin Mch. Wks.

SECOND HAND MACHINERY AND SUPPLIES.
Old Hickory Powder Plant.
Toomey, Frank, Inc.

SECTION BEAMS.
(See Beams.)

SELVAGE HARNESS.
(See Harness.)

SEPARATORS (STEAM).
Locke Regulator Co.

SEWING MACHINES.
Merrow Machine Co., The.
Textile Finishing Mchry. Co.
Wilcox & Gibbs Sewing Mch. Co.

SHADES—ELECTRIC LAMP.
(See Reflectors.)

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Cresson-Morris Co.
Dodge Mfg. Co.
Fafnir Bearing Co.
Fulton Supply Co.
Hyatt Roller Bearing Co.
Link-Belt Company.
Skayef Ball Bearing Co.

SHEET STEEL (PLAIN AND GALVANIZED).
Ryerson & Son, Inc., Jos. T.

SHELVING—SECTIONAL STEEL.
Dowman, George.
Dowman-Dozier Mfg. Co.
Hyatt Roller Bearing Co.
Mills Co.
Sanymetal Products Co.

SHINGLES—ASPHALT.
Dowman, George.
Dowman-Dozier Mfg. Co.

SHINGLES (METAL).
Cortright Metal Roofing Co.
Dowman, Geo.
Dowman-Dozier Mfg. Co.

SHINGLES—WOOD.
Southern Cypress Mfg. Asso.
Southern Wood Preserving Co.

SHIPPING ROOM MACHINERY AND SUPPLIES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Dixie Seal & Stamp Co.
Hightower Box & Tank Co.
Morris & Co., Inc.
Smith Mfg. Co.
Toledo Scale Co.

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Durabilt Steel Locker Co.
Mills Co.
Sanymetal Products Co.

SHUTTLES.
Brown Co., David.
Crompton & Knowles Loom Works.
Draper Corporation.
Jordan Mfg. Co.
Shambow Shuttle Co.
U S Bobbin & Shuttle Co.
Williams Co., J. H.

SILK YARNS.
Meritzer, H. S.

SINGEING MACHINERY.
Butterworth & Sons Co., H. W.
Phila. Drying Machine Co.
Textile Finishing Machinery Co., The.

SITES FOR FACTORIES.
(See Industrial Sites.)

SIZE BOX TEMPERATURE CONTROLLER.
Foxboro Co., Inc., The.

SIZE KETTLES AND TANKS.
(See Bleaching Kiers or Tanks.)

SIZING AND FINISHING COMPOUNDS.
(See Finishing and Sizing Materials.)

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Jordan Mfg. Co.

SKYLIGHTS.
Dowman, George.
Dowman-Dozier Mfg. Co.

SLAG FOR CONCRETE.
Birmingham Slag Co.

SLASHERS AND SLASHER ROOM SUPPLIES.
Butterworth & Sons Co., H. W.
Howard & Bullough.
Mossberg Pressed Steel Corp.
Saco-Lowell Shops.
Textile Finishing Machinery Co., The.

SLASHER CLOTH.
(See Cloth.)

SLASHER TAPE.
(See Tape—Slasher.)

SLATE ASPHALT ROOFING.
Barrett Co.

SLIDING PARTITION HARDWARE.
Dowman, George.
Dowman-Dozier Mfg. Co.
Lyon Metallic Mfg. Co.
Sanymetal Products Co.
Wagner Mfg. Co.

SLUBBERS.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.

SMOKE SCREENS.
Dowman, George.

SMOKE STACKS.
Dowman-Dozier Mfg. Co.
Walsh & Weidner Boiler Co.

SOAPS—TEXTILE.
Arabol Mfg. Co.
Arnold, Hoffman & Co.
Borne, Scrymser Co.
Ciba Co., Inc.
Fleischmann Co., The.
India Alkali Works.
Kali Mfg. Co.
Klipstein & Co., A.
Lennig & Co., Chas.
Mathieson Alkali Works, Inc.
Newport Chemical Wks.
Rohm & Haas Co.
Sonneborn Sons, Inc., L.
Stein, Hall & Co.
United Chemical Products Corp.
Warren Soap Mfg. Co.
Wolf & Co., Jacques.

SOFTENERS—COTTON.
(See Finishing & Sizing Materials.)

SOFTENERS—WATER.
(See Water Softeners.)

SOLDERLESS CONNECTORS—FRANKEL.
Westinghouse Elec. & Mfg. Co.

SOLOZONE.
Roessler & Hasslacher Chem. Co.

SOLVENTS.
(See Finishing.)

SPEEDERS.
Jordan Mfg. Co.
Parker & Co., Walter L.
U S Bobbin & Shuttle Co.

SPEED VARYING TRANSMISSION.
Reeves Pulley Co.

SPEEDOMETERS.
(See Counters.)

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Draper Corporation.
Saco-Lowell Shops.
Southern Spindle & Flyer Co.
Whitin Machine Works.

SPINNERS.
(See Yarn Manufacturers.)

SPINNING FRAMES.
American Machine Co., H. & B.
Crompton & Knowles Loom Works.
Howard & Bullough.
Saco-Lowell Shops.
Schaum & Uhlinger.
Whitin Machine Works.

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Draper Corporation.
Fulton Supply Co.
Howard & Bullough.
Saco-Lowell Shops.
Whitin Machine Works.
Whitinsville Spinning Ring Co.

SPINNING TAPE SPECIALISTS.
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Barber Mfg. Co.

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Barber-Colman Co.
Draper Corporation.
Foster Mch. Co.
Mill Devices Co.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
Whitin Machine Works.

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Brown Co., David.
Fulton Supply Co.
Jordan Mfg. Co.
Lestershire Spool & Mfg. Co.
Mossberg Pressed Steel Corp.
Parker Co., Walter L.
Steel Heddle Mfg. Co.
Textile Rubber Co.
U S Bobbin & Shuttle Co.

SPRAYING DEVICE FOR PAINTING.
(See Paint Spray.)

SPRINKLER TANKS.
(See Tanks, Towers, Etc.)

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Morse Chain Co.

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Bradley Mfg. Co., A. J.
Dixie Seal & Stamp Co.

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(See Tanks.)

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Borne, Scrymser Co.
Bosson & Lane.
Ciba Co.
Corn Products Refining Co.
Fleischmann Co., The.
Kali Mfg. Co.
Klipstein & Co., A.
Keever Starch Co.
Mathieson Alkali Works, Inc.
Metz Co., H. A.
Newport Chemical Wks.
Penick & Ford, Ltd.
Sonneborn Sons, Inc., L.
Staley Co., A. E.
Stein, Hall & Co.
Warren Soap Mfg. Co.

STEAM ENGINES.
(See Engines—Steam.)

STEAM PUMPS.
(See Pumps—Steam.)

STEAM SEPARATORS.
(See Separators.)

STEAM TRAPS.
(See Traps—Steam.)

STEEL (BARS, SHAPES, PLATES, SHEETS, ETC.)
Ryerson & Son, Inc., Jos. T.

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Bogart & Carlough.
Dowman, George.
Maryland Metal Bldg. Co.

STEEL SASH.
(See Window Sash.)

STEEL SHELVING, DOORS, WINDOWS, PARTITIONS, ETC.
Bogart & Carlough.
Dowman, George.
Dowman-Dozier Mfg. Co.
Sanymetal Products Co.
Truscon Steel Co.

STEELS (STRUCTURAL).
Dowman, George.
Bogert & Carlough.

STENCILS AND STENCIL PAPERS.
(See Stamps and Stencils.)

STENCIL BRUSHES.
(See Marking Pots and Brushes.)

STENCIL CUTTING MACHINES.
Atlanta Stamp & Stencil Wks.
Bradley Mfg. Co., A. J.
Dixie Seal & Stamp Co.

STICKS—PICKER.
(See Picker Sticks.)

STOOLS.
(See Furniture—Mill.)

STOP MOTION.
Crompton & Knowles Loom Works.
Draper Corporation.
Eclipse Textile Devices, Inc.
Whitin Machine Works.
Wildman Mfg. Co.

STOKERS.
Vogt Brothers Mfg. Co.
Westinghouse Elec. & Mfg. Co.

STORAGE RACKS.
(See Shelving.)

STORAGE TANKS.
(See Tanks.)

STRAPS (LUG, CHECK, HEEL, TUGGER, PICKER, HARNESS, ETC.)
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Bond Co., Chas.
Fulton Supply Co.
Garland Mfg. Co.
Jacobs Mfg. Co., E. H.

STRAPPING.
(See Leather Specialties or Check Straps.)

STREET PAVING.
McCrary Co., J. B.

STREET LIGHTING FIXTURES
General Elec. Co.
Huntington & Guerry, Inc.
McCrary Co., J. B.
Westinghouse Elec. & Mfg. Co.

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Howard Bros. Mfg. Co.

SULPHIDES.
(See Finishing & Sizing Materials.)

SUPPLIES—GENERAL MILL.
Dodge Mfg. Co.
Fulton Supply Co.
Jenkins Bros.
Link-Belt Co.
Lunkenheimer Co.
Morse Chain Company.
Rhoads & Sons, J. E.
Williams & Sons, I. B.

SUPPLIES (OFFICE).
(See Office Equipment.)

SWEEPS.
(See Brushes.)

SWINGS (PLAYGROUND).
(See Playground Equipment.

SWITCHES—KNIFE-ELECTRIC.
Fulton Supply Co.
General Electric Co.
Westinghouse Electric & Mfg. Co.

SWITCHBOARDS—PANEL.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

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Ernst & Ernst.

TABLES (METAL).
(See Furniture.)

TAPES—MILL.
Sanymetal Products Co.

TACHOMETERS (RECORDING AND INDICATING).
Foxboro Co., Inc., The.
Root Co.

TALLOW.
(See Finishing Machinery.)

TANKS (ELEVATED).
Dowman-Dozier Mfg. Co.
Lombard Iron Works.
Rome Machine & Fdry. Co.
Walsh & Weidner Boiler Co.
Woolford Wood Tank Co., G.

TANKS—OIL.
Bowser & Co., Inc., S. F.

TANKS (SPRINKLER).
Lombard Iron Works.
Rome Machine & Fdry. Co.
Woolford Wood Tank Co., G.

TANKS (STEEL STORAGE).
American Oil Pump & Tank Co.
Dowman-Dozier Mfg. Co.
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Philadelphia Drying Mchry. Co.
Proctor & Schwartz, Inc.
Textile Finishing Mchry. Co.
Woolford Wood Tank Co., G.

TAPE LOOMS—COTTON.
Foster Mch. Co.
Fletcher Works.
Schaum & Uhlinger.

TAPES AND BRAIDS.
American Textile Banding Co., Inc.
Barber Mfg. Co.
Weimar Brothers.

TAPES—SPINNING AND TWISTING.
Barber Mfg. Co.

TAPE MAKING MACHINES.
(See Bandage and Tape Machinery.)

TAPIOCA FLOUR.
Stein, Hall & Co.

TARPAULINS.
Smith Mfg. Co.

TAX SERVICE.
Ernst & Ernst.

TELEPHONE—CALLING SYSTEM.
Carter Electric Co.
General Electric Co.

TEMPERATURE CONTROLLERS AND REGULATORS.
Carrier Eng. Corp.
Foxboro Co., Inc., The.
Fulton Co.
Locke Regulator Co.
Parks-Cramer Co.
Taylor Instrument Co.

TEMPLES.
Draper Corporation.

TENTS (ALL KINDS).
Smith Mfg. Co.

TENTERS.
Butterworth & Sons Co., The.
Textile Finishing Mach. Co.

TENTER HOUSING & RECONSTRUCTING SYSTEM.
Proctor & Schwartz, Inc.

TESTERS FOR YARN, FABRIC CORD, ROPE, RUBBER, WIRE, ETC.
Scott & Co., Henry L.

TEXTILE MACHINERY.
(See Cotton Mill Machinery.)

THEATRE EQUIPMENT.
Southern Theatre Equip. Co.

THERMOMETER—ANGLE AND STRAIGHT STEM.
Foxboro Co., Inc., The.
Taylor Instrument Co.

THERMOMETERS—RECORDING AND INDEX.
Foxboro Co.
Taylor Instrument Co.

THERMOSTATS.
Foxboro Co.

THIN PLACE PREVENTERS.
Draper Corporation.

THREAD GUIDES.
Mitchell-Bissell Co.
Palmer Co., The I. E.

TILE ROOFING.
Richardson Co.

TIMBER.
(See Lumber.)

TIME CLOCKS.
(See Clocks.)

TIES—BALING.
(See Bale Ties.)

TIRE FABRIC EQUIPMENT.
Fletcher Works.

TOILETS.
Davis Septic Tank & Eng. Co.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

TOILETS (SEPTIC TANK).
Davis Septic Tank & Eng. Co.

TOILET PARTITIONS.
Dowman, George.
Dowman-Dozier Mfg. Co.
Mills Co.
Sanymetal Products Co.

TOOLS (MACHINE—HAND & ELECTRIC).
Fulton Supply Co.
Iverson & Son, Inc., Jos. T.

TOOL CABINETS—STEEL.
Durabilt Steel Locker Co.
Mills Co.

TOOL STANDS—STEEL.
Mills Co.

TOP FLATS RECOVERED.
Howard Bros. Mfg. Co.

TORCHES (BRAZING, CUTTING AND WELDING).
Bird-Potts Co., Inc.
Oxweld Acetylene Co.

TOWERS.
(See Tanks—Elevated.)

TRACTORS (ELECTRIC).
Elwell-Parker Electric Co.

TRANSMISSION—POWER.
(See Power Transmission Machinery.)

TRAPS—RETURN STEAM.
American Blower Co.
Locke Regulator Co.
Morehead Mfg. Co.

TRAVELERS.
Dary Ring Traveler Co.
Fulton Supply Co.
Whitinsville Spinning Ring Co.

TRIPTODS.
U S Bobbin & Shuttle Co.

TROLLEYS & HOISTS.
Chisholm-Moore Mfg. Co.
Curtis Pneumatic Machy. Co.
Elwell-Parker Electric Co.
Louden Mchry. Co.
Iverson & Son, Inc., Jos. T.

TRUCKS—AUTO.
White Co.

TRUCKS, BASKETS, ETC.
Allen Co.
Morris & Co., Inc.
Smith Mfg. Co.
Washburn, Inc.

TRUCKS (BEAM).
Allen Co.

TRUCKS (ELECTRIC).
Elwell-Parker Electric Co.

TRUCKS (FILLING BOARD).
Davis Mfg. Co., Frank.

TRUCKS, INTER, ETC.
Allen Co.
Elwell-Parker Electric Co.
Morris & Co., Inc.
Washburn, Inc.

TRUCKS (WELDERS).
Oxweld Acetylene Co.

TUBES AND CONES.
Sonoco Products Co.

TUBS.
(See Tanks—Wooden.)

TUBING—METAL.
Dowman-Dozier Mfg. Co.
Youngstown Sheet & Tube Co.

TURBINES—HYDRAULIC.
Allis-Chalmers Mfg. Co.
General Electric Co.
Westinghouse Elec. & Mfg. Co.

TURBINES—STEAM.
Allis-Chalmers Mfg. Co.
American Blower Co.
General Electric Co.
Sturtevant Co., B. F.
Westinghouse Elec. & Mfg. Co.

TURBO UNDERGRATE BLOWERS.
American Blower Co.

TWISTING MACHINERY AND SUPPLIES.
Barber Mfg. Co.
Draper Corporation.
Foster Mch. Co.
Howard & Bullough.
Proctor & Schwartz, Inc.
Saco-Lowell Shops.
U S Bobbin & Shuttle Co.
Whitin Machine Works.

UNIONS—BRONZE.
Fulton Supply Co.
Jenkins Bros.
Locke Regulator Co.
Lunkenheimer Co.

URINALS.
Rundle-Spence Mfg. Co.
Vogel Co., Jos. A.

VACUUM GAUGES.
(See Gauges.)

VACUUM PANS.
Cresson-Morris Co.

VALVES—ANGLE, GLOBE, CROSS, BLOW-OFF, CHECK, GATE, POP-SAFETY, ETC.
Fulton Supply Co.
Jenkins Bros.
Locke Regulator Co.
Lunkenheimer Co.

VALVES (BACK PRESSURE).
Jenkins Bros.
Locke Regulator Co.
Lunkenheimer Co.
Oxweld Acetylene Co.

VALVES—NON-RETURN STOP.
Fulton Supply Co.
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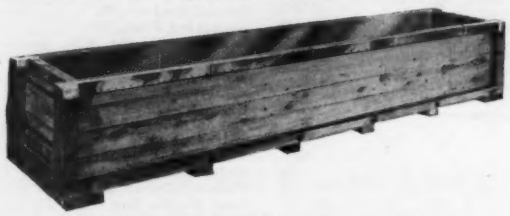

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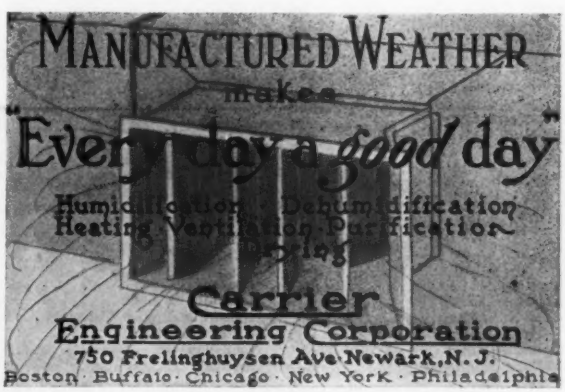

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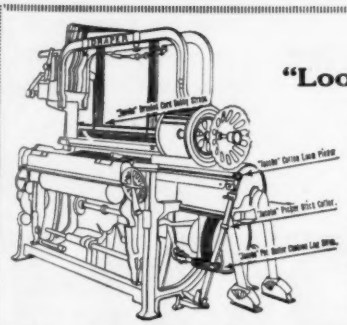

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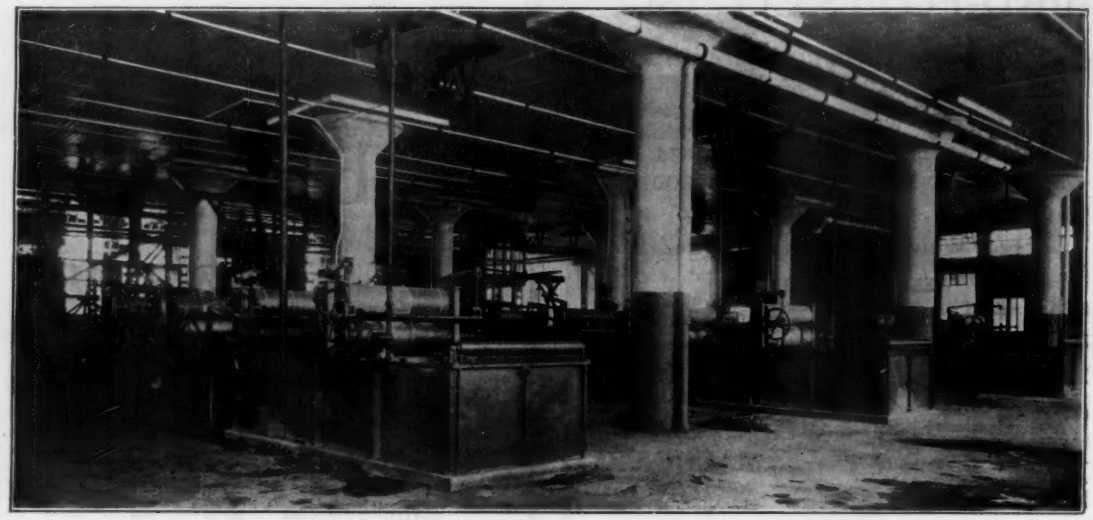

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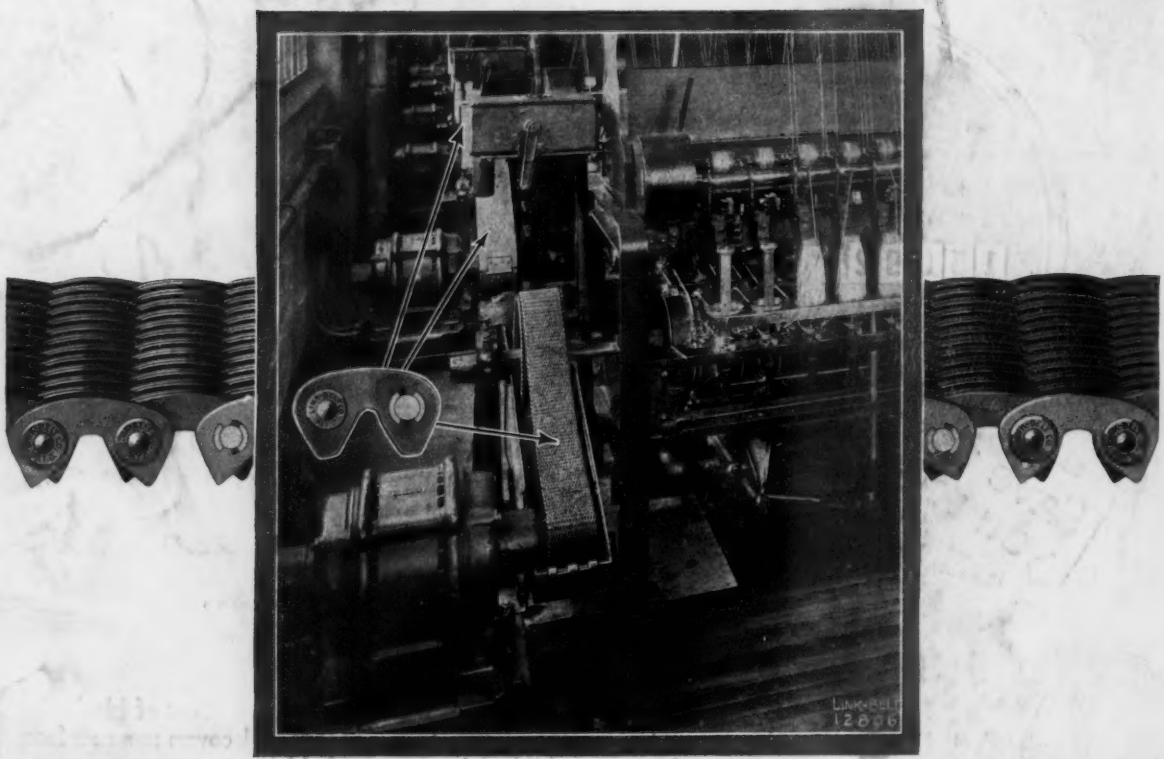

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